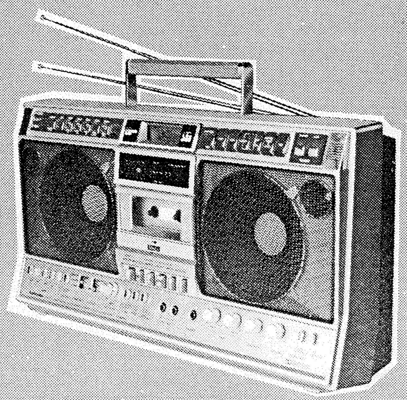
SERVICE DATA
FILE NO. 110-243

TOSHIBA

QUARTZ LOCK DIGITAL SYNTHESIZER STEREO CASSETTE RECORDER

RT-9510S



SPECIFICATIONS

■ Clock

Accuracy:	Within ±10 sec (per month) at 25°C
Power source:	DC 3V (SUM-3 "AA" size x 2)
Battery life:	About one year

■ Cassette Recorder

Cassette tapes used:	C-30 – C-120
Tape speed:	4.8 cm/sec.
Track system:	4-track, 2-channel, stereophonic
Recording system:	AC bias (85 kHz)
Erasing system:	AC erasing (85 kHz)
Frequency response:	80 Hz – 10 kHz
Noise reduction:	Dolby NR
Jacks:	[EXT MIC] jack x 2 (6.3mm dia.), impedance 10K ohm [PHONES] jack (3.6mm dia.) [PHONO] jack x 2, impedance 10K ohm [LINE OUT] jack x 2, impedance 2.2K ohm [EXT SP] jack x 2 (3.5mm dia.), impedance 3.2 – 8 ohm [DIN] jack, 5 PIN (REC/PB), impedance output 4.7K ohm, input 47K ohm

■ Radio

Receiving frequency:	FM 87.5 – 108 MHz LW 146 – 281 kHz MW 522 – 1611 kHz SW1 2.2 – 5.825 MHz SW2 5.8 – 15.5 MHz
Intermediate frequency:	FM 10.7 MHz SW2/SW1/MW/LW 450 kHz
Antennas:	FM; Ext. antenna (FM only) FM/SW1/SW2; Telescopic antenna MW/LW; Ferrite core antenna

■ General

Speakers:	160mm (dia.) dynamic speaker (woofer) x 2 40mm (dia.) dynamic speaker (tweeter) x 2
Power sources:	AC 220 – 240V ~, 50 Hz DC 12V (SUM-1 "D" size x 8) External DC power - DC 12V (5.0mm dia.) Centre pin - Positive pole
Power output:	5W x 2, 10% distortion
Power consumption:	28W
Dimensions:	(W)545 x (H)285 x (D)150 mm
Weight:	7.3 kg (with batteries)

Specifications are subject to change without notice.

TE, TU, AY

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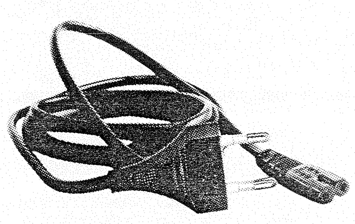
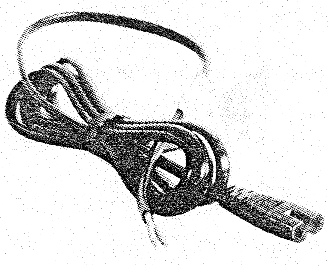
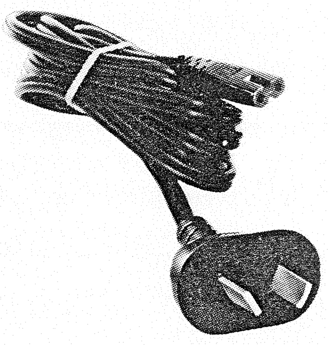
Power Cord



TE

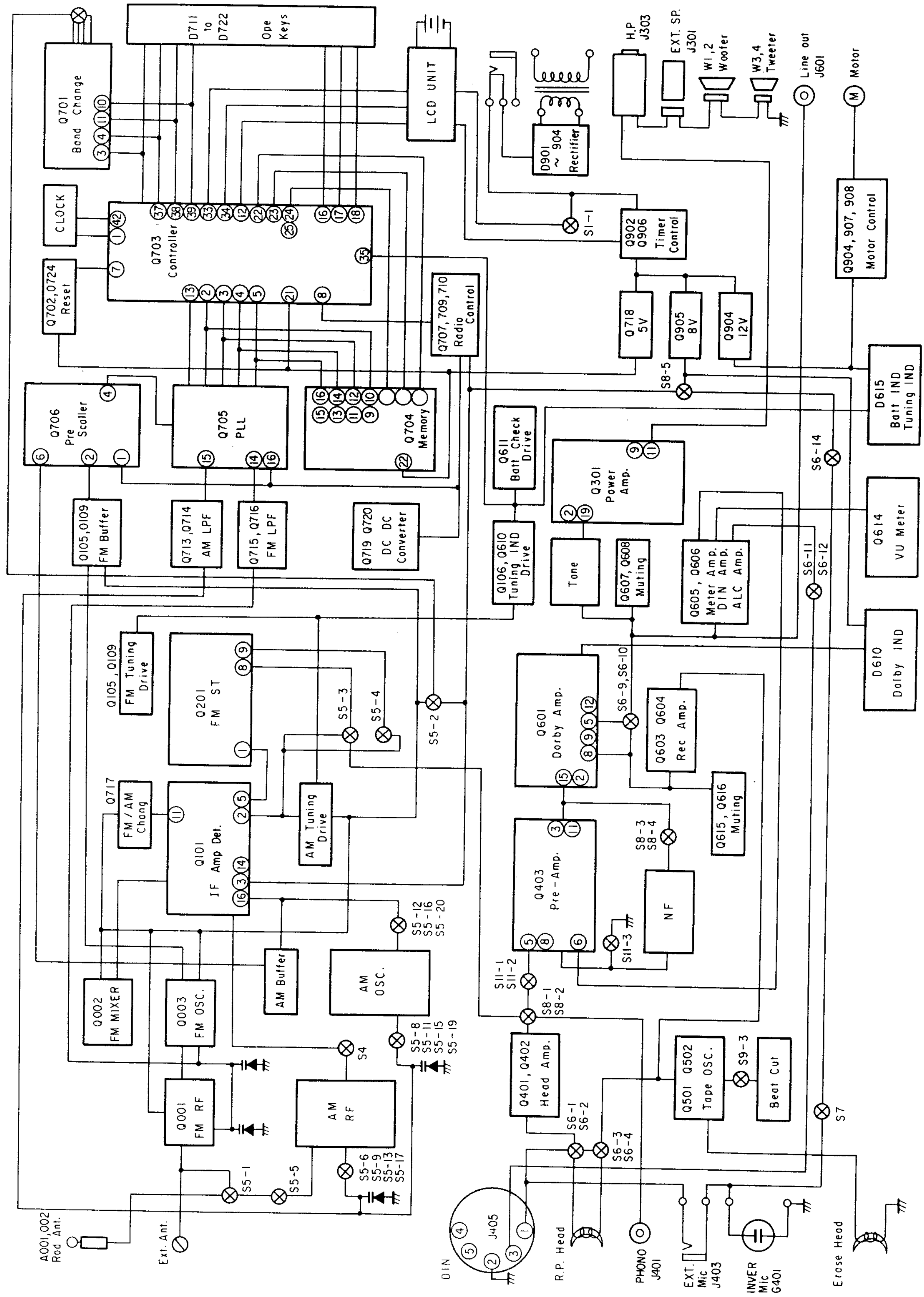


TU



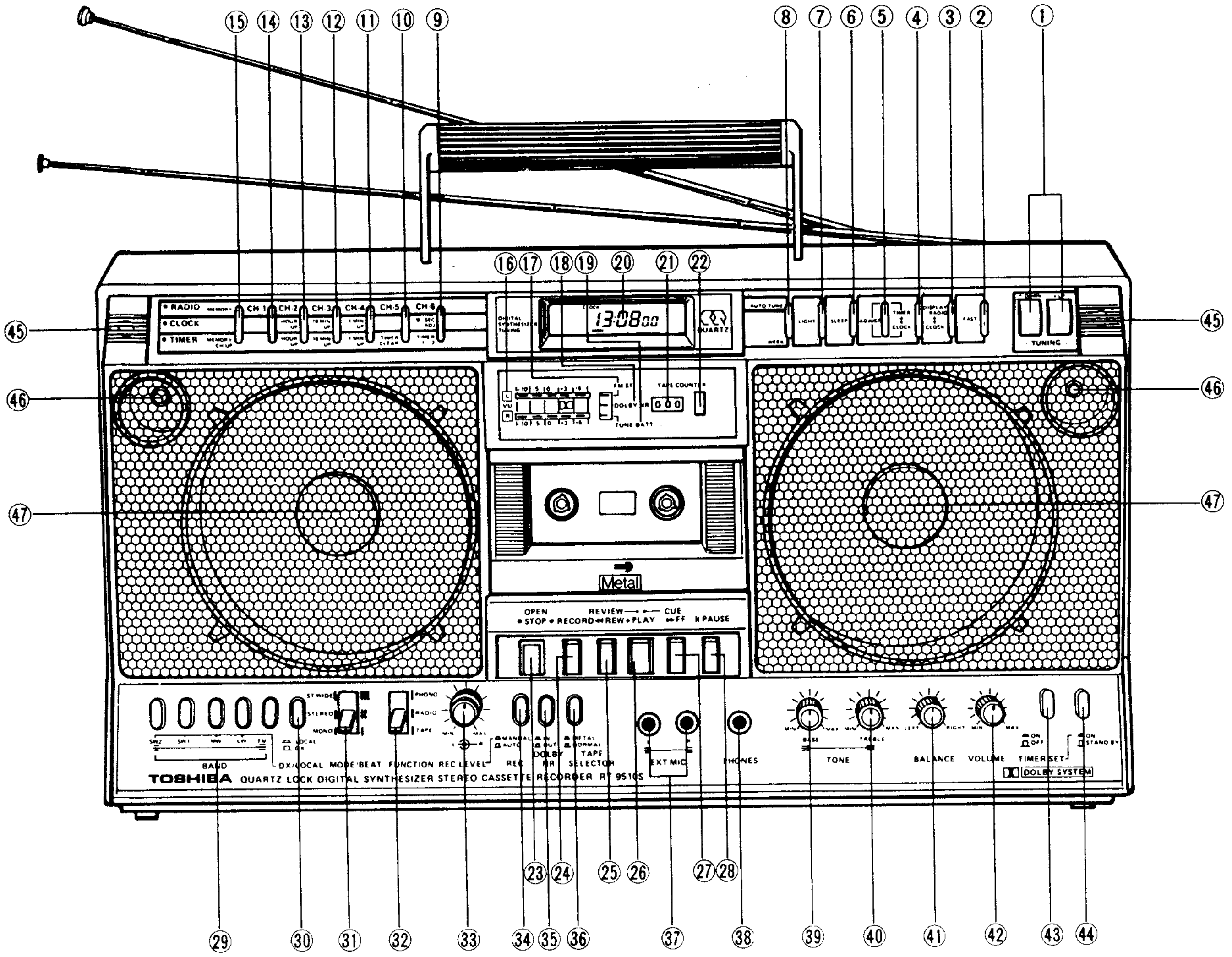
AY

1. BLOCK DIAGRAM


Q701 Band Change
D711 to D722 Ope Keys
LCD UNIT
CLOCK
Q702,0724 Reset
Q703 Controller
Q707, 709, 710 Radio Control
Q706 Pre Scaller
Q705 PLL
Q704 Memory
Q105, Q109 FM Buffer
Q713, Q714 AM LPF
Q715, Q716 FM LPF
Q719 Q720 DC DC Converter
Q611 Batt Check Drive
Q106, Q610 Tuning IND Drive
Q301 Power Amp.
Tone
Q607, Q608 Muting
Q605, Q606 Meter Amp. DIN Amp. ALC Amp.
Q614 VU Meter
D615 Batt IND Tuning IND
D610 Dolby IND
Q904, 907, 908 Motor Control
Q902 Q906 Timer Control
Q718 5V
Q905 8V
Q904 12V
D901 ~ 904 Rectifier
S1-1
S8-5
S6-14
S6-11 S6-12
H.P J303
EXT. SP. J301
W1,2 Woofer
W3,4 Tweeter
Line out J601
M Motor
Q105, Q109 FM Tuning Drive
Q201 FM ST
S5-3
S5-4
S5-2
Q717 FM/AM Chang
Q101 IF Amp Det.
AM Tuning Drive
Q601 Dolby Amp.
S6-9, S6-10
Q603 Q604 Rec Amp.
Q615, Q616 Muting
S8-3 S8-4
NF
Q403 Pre-Amp.
S11-3
S11-1 S11-2
S8-1 S8-2
S5-12 S5-16 S5-20
AM OSC.
AM Buffer
Q002 FM MIXER
Q003 FM OSC.
S4
S5-8 S5-11 S5-15 S5-19
Q001 FM RF
AM RF
S5-6 S5-9 S5-13 S5-17
S5-1
S5-5
A001,002 Rod Ant.
Ext. Ant.
Q401, Q402 Head Amp.
Q501 Q502 Tape OSC.
S9-3
Beat Cut
S7
S6-1 S6-2
S6-3 S6-4
DIN J405
R.P. Head
PHONO J401
EXT. Mic J403
INVER Mic G401
Erase Head

2. OPERATING CONTROLS

Controls and Functions


①
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㊼
RADIO
CLOCK
TIMER
MEMORY
MEMORY CH UP
CH 1
CH 2
CH 3
CH 4
CH 5
CH 6
HOUR UP
10 MIN UP
1 MIN UP
TIMER CLEAR
SEC ADJ
DIGITAL SYNTHESIZER TUNING
CLOCK
13:08 00
QUARTZ
AUTO TUNE
WEEK
LIGHT
SLEEP
ADJUST
TIMER ↕ CLOCK
DISPLAY RADIO ↕ CLOCK
FAST
TUNING
VU
L
R
FM ST
DOLBY NR
TUNE BATT
TAPE COUNTER
000
Metal
OPEN
STOP
RECORD
REVIEW
REW
PLAY
CUE
FF
PAUSE
SW2
SW1
MW
LW
FM
BAND
LOCAL
DX
DX/LOCAL
ST WIDE
STEREO
MONO
MODE/BEAT
PHONO
RADIO
TAPE
FUNCTION
MIN
MAX
REC LEVEL
MANUAL
AUTO
REC
IN
OUT
DOLBY NR
METAL
NORMAL
TAPE SELECTOR
EXT MIC
PHONES
MIN
MAX
BASS
TREBLE
TONE
LEFT
RIGHT
BALANCE
VOLUME
ON
OFF
ON
STAND BY
TIMER SET
DOLBY SYSTEM
TOSHIBA QUARTZ LOCK DIGITAL SYNTHESIZER STEREO CASSETTE RECORDER RT 9510S

Figure 1.

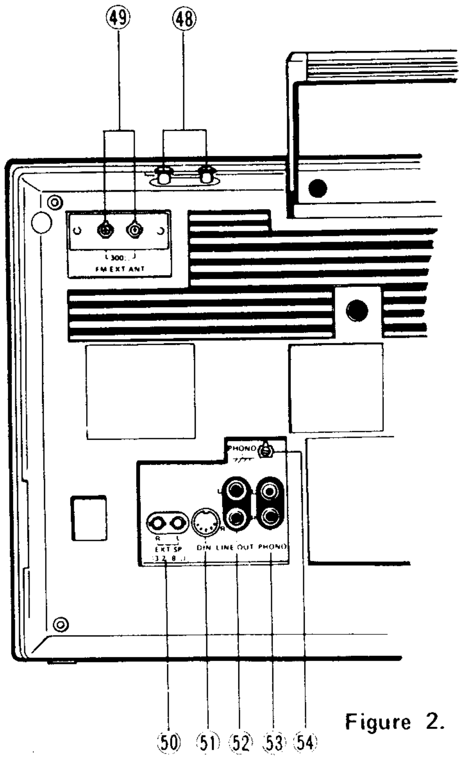

(49)
(48)
300Ω
FM EXT ANT
PHONO
L
R
EXT SP
DIN
LINE OUT
PHONO
(50)
(51)
(52)
(53)
(54)

Figure 2.

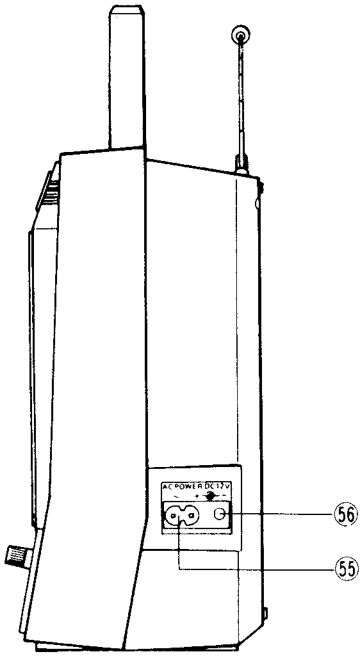

AC POWER
DC12V
(56)
(55)

Figure 3.

① **[TUNING]** button: UP/DOWN
② **[FAST]** button
③ **[DISPLAY RADIO ↕ CLOCK]** button
④ **[TIMER ↕ CLOCK]** button
⑤ **[ADJUST]** button
⑥ **[SLEEP]** button
⑦ **[LIGHT]** button
⑧ **[AUTO TUNE/WEEK]** button
⑨ **[CH6/CLOCK "0" SEC ADJ/TIMER 1 ↔ 2]** button
⑩ **[CH5/TIMER CLEAR]** button
⑪ **[CH4/CLOCK 1 MIN UP/TIMER 1 MIN UP]** button
⑫ **[CH3/CLOCK 10 MIN UP/TIMER 10 MIN UP]** button
⑬ **[CH2/CLOCK HOUR UP/TIMER HOUR UP]** button
⑭ **[CH1]** button
⑮ **[MEMORY/MEMORY CH-UP]** button
⑯ Level meters
⑰ **[FM-ST]** FM stereo indicator
⑱ **[DOLBY* NR]** indicator
⑲ **[TUNE/BATT]** Tuning/Battery indicator
⑳ Liquid Crystal Display
㉑ TAPE COUNTER
㉒ Reset button
㉓ **[■STOP/OPEN]** button
㉔ **[●RECORD]** button (One-touch recording)
㉕ **[◀◀REW/REVIEW]** button
㉖ **[▶PLAY]** button
㉗ **[▶▶FF/CUE]** button
㉘ **[II PAUSE]** button
㉙ **[BAND]** selector: SW2/SW1/MW/LW/FM
㉚ **[DX/LOCAL]** switch: LOCAL/DX
㉛ **[MODE]** switch: MONO/STEREO/STEREO WIDE
[BEAT] cut switch: (Interference elimination)
㉜ **[FUNCTION]** switch: TAPE/RADIO/PHONO
㉝ **[REC LEVEL]** control knobs
㉞ **[REC]** switch: MANUAL/AUTO
㉟ **[DOLBY* NR]** switch: IN/OUT
㊱ **[TAPE SELECTOR]** switch: METAL/NORMAL
㊲ **[EXT MIC]** jacks (External microphone 6.3 mm dia.)
㊳ **[PHONES]** jack (Headphone 6.3 mm dia.)
㊴ **[BASS]** control knob
㊵ **[TREBLE]** control knob
㊶ **[BALANCE]** control knob
㊷ **[VOLUME]** control knob
㊸ **[TIMER SET]** switch: ON/OFF
㊹ **[ON/STAND BY]** switch
Depress this switch to turn the power on and depress once more to place the set in stand-by mode.
㊺ Built-in microphones
㊻ Tweeter
㊼ Woofer
㊽ Telescopic antennas
㊾ **[FM EXT ANT]** terminals
(FM external antenna)
㊿ **[EXT SP]** jacks (External speaker 3.2–8 ohm)
(51) **[DIN]** jack socket (5-pin)
(52) **[LINE OUT]** jacks
(53) **[PHONO]** jacks
(54) **[PHONO ⏚]** terminal
Connect to turntable ground terminal
(55) **[AC POWER]** jack
(56) **[DC 12V]** jack (External DC power)
Plug car adaptor (optional) into this jack
(Centre pin . . . . positive)

* Noise reduction system manufactured under license from Dolby Laboratories. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

Notes:
1. In the STAND-BY position the AC mains power will still be supplied to this set. Therefore when not in use unplug the power cord from the socket.
2. Do not plug the power cord into a power outlet while the [ON/STAND BY] switch is at the ON position; otherwise, the audible output may be muted by the muting circuit. In such event, press the [ON/STAND BY] switch again.
3. When the [ON/STAND BY] switch is pressed ON to listen to radio, do not switch almost immediately to STAND BY and back to ON again before the radio frequency is displayed, since the CLOCK time may be displayed instead, and no sound be obtained.
   If this happens, simply repress the [ON/STAND BY] switch.
4. If the audible output is distorted or interrupted during radio reception or radio programme recording it indicates that the internal batteries are over-discharged. Replace all of the eight SUM-1 "D" size dry cells with new ones. (During radio reception or radio programme recording, the [TUNE/BATT] indicator ⑲ functions only as a tuning indicator and does not work as a battery indicator.)

Radio Listening

- Approximately 5 seconds after completing station tuning, the tuned frequency display will automatically switch back to the clock display. If continued display of the tuned frequency is required, press the [DISPLAY RADIO ↕ CLOCK] button ③. (Note that the tuned frequency and clock displays are shown alternately every time the [DISPLAY RADIO ↕ CLOCK] button ③ is pressed.)
- The channel display is included in the clock display only when a station has been selected by preset tuning.
- To listen to distant (weak signal) stations in the LW/MW/SW1/SW2 bands, set the [DX/LOCAL] button ㉚ to the DX position. For closer (strong signal) stations, set to the LOCAL position.
- For reception in the FM band, extend the two rod antennas ㊽ and adjust the angles to obtain optimum reception. For short-wave reception, extend the left hand antenna fully. Reception in the MW and LW bands involves the use of the built-in ferrite antenna.
- Note that the muting circuit is activated during tuning, so no sound will be heard until the station is tuned.

I Auto-tuning

❶ Push the [ON/STAND BY] switch ㊹ ON.
❷ Set the [TIMER SET] switch ㊸ OFF.
❸ Set the [FUNCTION] switch ㉜ to the RADIO position.
❹ Press the desired [BAND] selector ㉙.
❺ When the [AUTO TUNE] button ⑧ is then pressed, the frequency will be increased automatically one step at a time until a broadcasting station is reached. (See Table 1).
❻ Adjust volume, balance and tone.

- During auto-tuning, relatively weak (remote) stations will be ignored. For tuning to such stations, refer to the manual tuning procedure described below.
- When a very strong station is tuned during auto-tuning in the short wave band, the auto-tuning may sometimes stop about 5 kHz below the actual frequency of that station. In this case, fine tune the station by pressing the TUNING button.

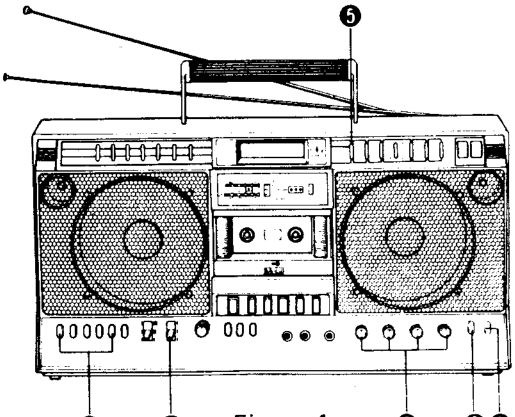


Figure 4.

II Manual tuning

❶ Repeat steps ❶ to ❹ of the auto-tuning procedure.
❷ Press either UP or DOWN of the [TUNING] button ①.
❸ Then repeat step ❻ of the auto-tuning procedure.
The frequency will change by a single step every time UP or DOWN is pressed, but will change continuously if the relevant button remains depressed.
If the [FAST] button ② is also pressed at the same time, the step-wise frequency changes will be speeded up 10 times.

Table 1 Step Frequencies

	Auto-tuning	Manual tuning
FM	100 kHz	50 kHz
LW	9 kHz	1 kHz
MW	9 kHz	9 kHz
SW1	5 kHz	5 kHz
SW2	5 kHz	5 kHz

RADIO
FM
100.0s
MHz

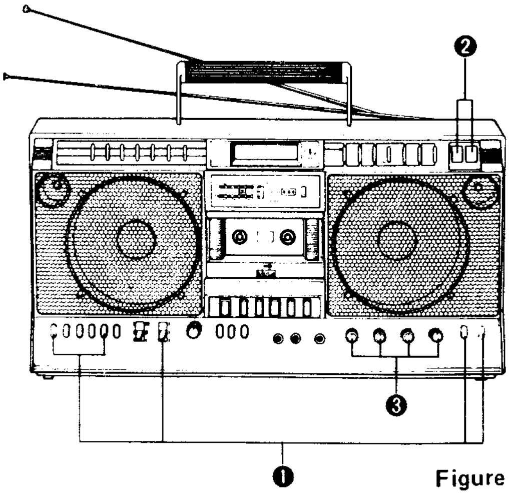


Figure 5.

III Preset tuning

- Once a certain station has been preset, it may be tuned automatically by simply pressing the corresponding channel selector button.

[1] Preset tuning and changing previously preset channels

❶ Tune to the desired station by either auto-tuning or manual tuning.

❷ Press the [MEMORY] button ⑮, and then while the channel display ⑳ is blinking on and off (approx. 5 seconds) press a suitable channel button to preset the tuned station at that channel. (Note that 6 stations may be preset for each band).

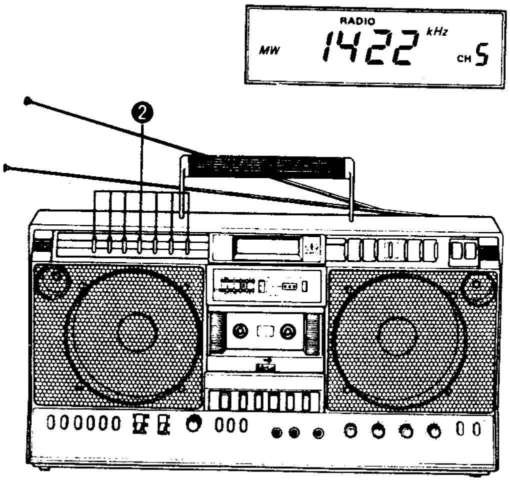


Figure 6.

[2] Automatic tuning of a preset station

❶ Repeat steps ❶ to ❹ of the auto-tuning procedure.

❷ Then press the desired channel button.

❸ Repeat step ❻ of the auto-tuning procedure.

Note: On rare occasion, external noise etc. may result in incorrect display of the 10MHz digit of the tuned frequency during short wave reception, even though reception is normal.
To correct the display, simply press the UP button to increase the frequency by a small margin. The display will be corrected automatically by this operation, and the desired frequency may then be retuned.

Tape Playback

<with cassette tape>

❶ Set the [ON/STAND BY] switch ㊹ ON.

❷ Set the [TIMER SET] switch ㊸ OFF.

❸ Set the [FUNCTION] switch ㉜ to the "TAPE" position.

❹ Insert the cassette tape.

❺ Set the [DOLBY NR] switch ㉟ to desired position.

❻ Set the [TAPE SELECTOR] switch ㊱ according to th type of tape used.

❼ Press the [▶PLAY] button ㉖.

❽ Set the [MODE] switch ㉛ to desired position.

❾ Adjust volume, balance and tone.

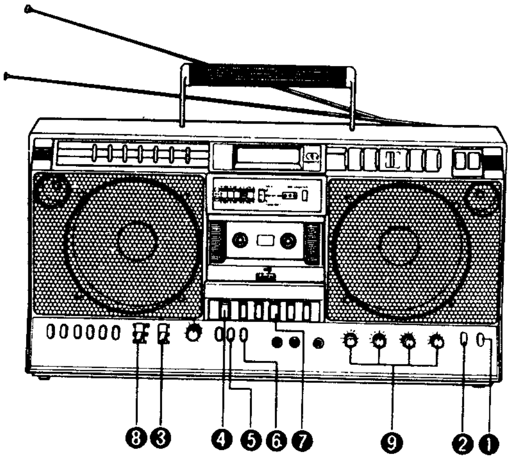


Figure 7.

Listening to Peripheral Equipment

<with turntable (MM type)>

❶ Connect the turntable to the [PHONO] jacks (53) and the [PHONO ⏚] terminal (54).

❷ Press the [ON/STAND BY] switch ㊹ to "ON".

❸ Set the [TIMER SET] switch ㊸ OFF.

❹ Set the [FUNCTION] switch ㉜ to "PHONO".

❺ Play the desired record.

❻ Set the [MODE] switch ㉛ to desired position.

❼ Adjust volume, balance and tone.

<with amplifier or tape deck>

❶ Connect DIN cord to the [DIN] jack (51).

❷ Press the [ON/STAND BY] switch ㊹ to "ON".

❸ Set the [TIMER SET] switch ㊸ OFF.

❹ Set the [FUNCTION] switch ㉜ to "TAPE".

❺ Set up your amplifier and deck for play.

❻ Set the [MODE] switch ㉛ to desired position.

❼ Adjust volume, balance and tone.

Recording

<radio broadcasts>

Note: If a whistling noise is audible during LW/MW programme recording, change the [BEAT] switch 31 to another position where there is less or no whistle.

❶ Tune to a radio station.

❷ Set the [DOLBY NR] switch ㉟ to desired position.

❸ Set the [TAPE SELECTOR] switch ㊱ according to the type of tape used.

❹ Insert the cassette tape.

❺ Set the [REC] switch ㉞ to "MANUAL" or "AUTO".

❻ ▭ MANUAL

Press the [‖ PAUSE] button ㉘ and the [● RECORD] button ㉔.

Note: Adjust the [REC LEVEL] control ㉝ so the level Meter LED at 3 dB flashes from time to time at the loudest passages of the programme.

Press the [‖ PAUSE] button ㉘ a second time to start recording.

▭ AUTO

Press the [● RECORD] button ㉔.

<external mic>

❶ Connect mic. to the [EXT MIC] jacks ㊲.

❷ Set the [FUNCTION] switch ㉜ to "TAPE".

❸ For succeeding operations, refer to ❷ to ❻ for **radio broadcasts**.

Note: Low impedance (200 ohm – 2 k ohm) is required for external mic.

<built-in mic>

❶ Set the [FUNCTION] switch ㉜ to "TAPE".

❷ For succeeding operations, refer to ❷ to ❻ for **radio broadcasts**.

Note: Set the [MODE] switch to either MONO or STEREO.
The MONO position also allows stereo recording.

<turntable (MM type) amplifier, tape deck>

❶ Connect the turntable and commence to play a phonograph record, or connect an amplifier and tape deck to the [DIN] jack (51) and set up your amplifier and deck for play.

❷ For succeeding operations, refer to ❷ to ❻ for **radio broadcasts**.

Erasing the Tape

To erase a recorded tape, start recording mode with the [FUNCTION] switch ㉜ at "PHONO" position.
During this operation both the [EXT MIC] and [PHONO] jacks must be disconnected.

Setting the Time

I Setting the present time

❶ Set the [ON/STAND BY] switch ㊹ ON.

❷ Set the [TIMER SET] switch ㊸ OFF.

❸ While pressing the [ADJUST] button ⑤, also,

(1) Press the [HOUR UP] button ⑬ to set the hour display.*1

(2) Press the [10 MIN UP] button ⑫ to set the 10-digit of the minute display.*1

(3) Press the [1 MIN UP] button ⑪ to set the 1-digit of the minute display.*1

(4) Press the [0 SEC ADJ] button ⑨ to set the seconds display to "00".*2

(5) Press the [WEEK] button ⑧ to set the day of the week.*1

*1 The display numeral (or day of the week) is changed one step at a time when the button is pressed for a brief period. If pressed for more than one second, the display numeral (or day of the week) will change continuously.

*2 If this button is pressed when the seconds display reads in the 00–29 range, the minute reading at that time will remain unchanged. If pressed when in the 30–59 range, however, the minute reading will be automatically increased by 1.

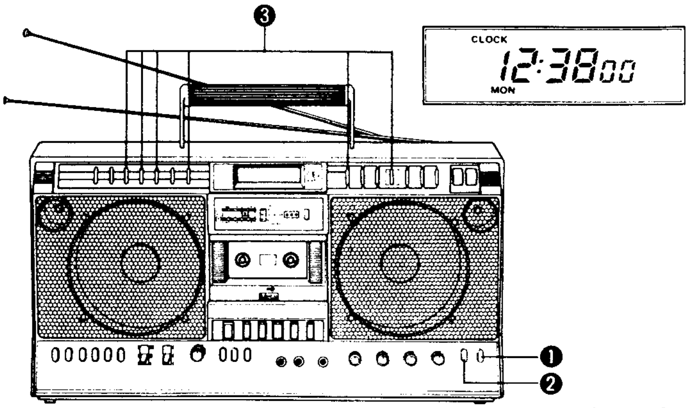


Figure 8.

II Setting a preset time

❶ Repeat steps ❶ and ❷ under "Setting the present time".

❷ While pressing the [ADJUST] button ⑤ press the [TIMER ↕ CLOCK] button ④ in order to switch to the TIMER display.

Note: Keep the [ADJUST] button ⑤ depressed until completion of the operations described in step ❸ below. Releasing this button prematurely will result in the CLOCK time being displayed again.

❸ Next repeat steps ❸-(1)–❸-(3) and ❸-(5) under "Setting the present time" *

* If the same preset time is required every day, set "EVE" by pressing the [WEEK] button ⑧

TIMER
23:30
CH -
SAT

Figure 9.

How to Use the TIMER

- When the TIMER is set to a certain desired time, the unit will be switched on automatically at that time, and then switch off again 60 minutes later.

Note: When the TIMER or SLEEP feature is active, the unit is automatically switched off exactly 60 minutes after a timer start. If, therefore, the tape play time is longer than 60 minutes even slightly, the ASO feature (p. 8) won't work, leaving the pinch roller pressed against the capstan. To prevent this, make certain to use a tape shorter than C-90.

I Radio reception

❶ Set the desired time according to the "Setting a preset time "procedure outlined on page 6.

❷ After selecting the desired band with [BAND] selector ㉙, while pressing the [ADJUST] button ⑤ press the [MEMORY CH-UP] button ⑮ to display the desired channel.

❸ After setting the [FUNCTION] switch ㉜ to "RADIO", set the [TIMER SET] switch ㊸ ON.

- The unit will switch on automatically at the preset time, and then switch off again 60 minutes later.

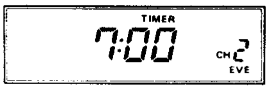


Figure 10.

II Recording a radio program

❶ Repeat steps ❶ to ❸ of the "Radio reception" procedure.

❷ Load a cassette tape and press the [●RECORD] button ㉔.

- Recording of the desired radio program will commence automatically at the preset time.
- If the end of the tape is reached within the 60 minute period, the tape will be stopped and the mode buttons released by the ASO mechanism. Radio rěception will continue, however, until the end of the 60 minute period.

III Tape playback

❶ Set the desired time according to the "Setting a preset time" procedure described on page 6.

❷ While pressing [ADJUST] button ⑤, press [MEMORY CH-UP] button ⑮ to select a channel among CH1 through CH6.

❸ Adjust the volume, balance and tone of the desired tape according to the "Tape Playback" outlined on page 5. Press the [■STOP] button ㉓ to release the [▶PLAY] button ㉖.

❹ Set the [TIMER SET] switch ㊸ ON.

❺ Press the [▶PLAY] button ㉖.

- Tape play will commence automatically at the preset time. When the end of the tape is reached, the ASO mechanism will stop the tape, release the mode button, and finally put the unit into the standby mode.

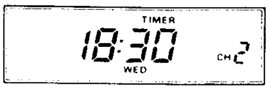


Figure 11.

IV TIMER setting for radio reception from two separate channels

❶ Set the [ON/STAND BY] switch ㊹ ON, and the [TIMER SET] switch ㊸ OFF.

❷ Press the [TIMER ↕ CLOCK] button ④ while pressing the [ADJUST] button ⑤, thereby switching to TIMER display 1.*[1]

❸ Set the required time by following the steps listed in step ❸ of "Setting a preset time" on page 6.

❹ Press the [MEMORY CH-UP] button ⑮ while pressing the [ADJUST] button ⑤ and stop when the desired channel is displayed.

❺ Next press the [TIMER 1↔2] button ⑨ to switch to TIMER display 2*[1] while pressing the [ADJUST] button ⑤.

❻ Repeat the above steps ❸ and ❹.

❼ Set the [FUNCTION] switch ㉜ to "RADIO", then the [TIMER SET] switch ㊸ to ON.

- The unit will switch on automatically at the TIMER display 1 and 2 preset times, and switch off again 60 minutes after each of those times.

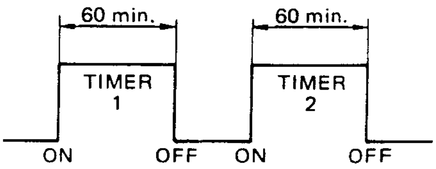


Figure 12.

*[1] Since number 1 or 2 is not displayed, it will be necessary to remember both times when they are initially set.

- If TIMER display time 2 is set within 60 minutes of TIMER display time 1, the TIMER 1 preset time will continue only up to the start of the TIMER 2 preset time, subsequently switching over to the latter preset time.

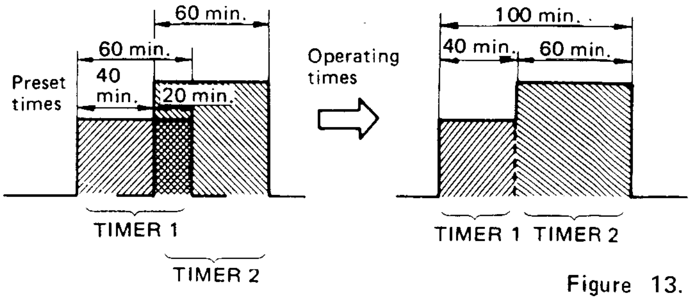


Figure 13.

V TIMER clearing

To clear TIMER settings, press the [ADJUST] button ⑤ during TIMER display, and then press the [TIMER CLEAR] button ⑩. (At this time, the channel display will read CH‾.) With 2-channel TIMER settings, also use the [TIMER 1↔2] button ⑨ to clear the TIMER settings for both channels.

How to Use the SLEEP Switch

❶ Tune to a radio station, or play a tape.
❷ Set the [TIMER SET] switch ㊸ ON.
❸ Then also set the [SLEEP] switch ⑥ ON.

- In this way, the unit will be switched off automatically 60 minutes later.

The following TIMER arrangement is possible with radio reception. That is, go to sleep while listening to the radio, and also awake to a radio program the next morning.

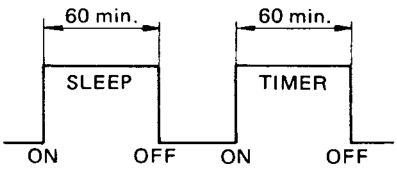


Figure 14.

Operating Hints

Erasure Prevention Tabs

This set has an erasure safety device. To prevent accidental erasure of a recorded tape, remove the tab as illustrated. To enable recording of a tape after removal of these tabs, cover the holes with adhesive tape.

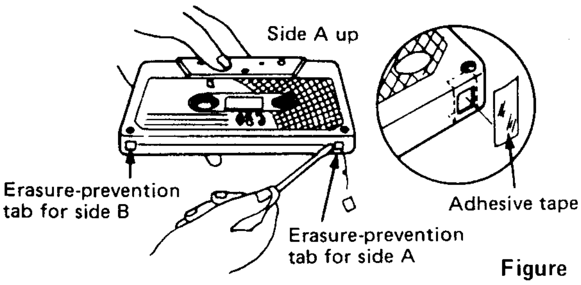

Side A up
Erasure-prevention tab for side B
Adhesive tape
Erasure-prevention tab for side A

Figure 15.

Full Auto Shut-Off (ASO) Mechanism

When the end of the tape is reached during playback, recording, fast forward or rewind modes, the ASO mechanism automatically stops the tape and disengages the tape transport. When the unit is not set up for the TIMER or SLEEP mode, the power to the unit remains on after the activation of the ASO. In this case, set the [ON/STAND BY] switch ㊹ to "STAND BY" to turn off the unit.

Mic Mixing

Playback

Note: If howling (acoustic feedback) occurs during mixing, reduce the VOLUME control or move your microphone away from the speaker.

<with cassette tape>

❶ Connect the external mic. to [EXT MIC] jack ㊲.
❷ Switch to playback mode.
❸ Adjust volume, balance and tone.

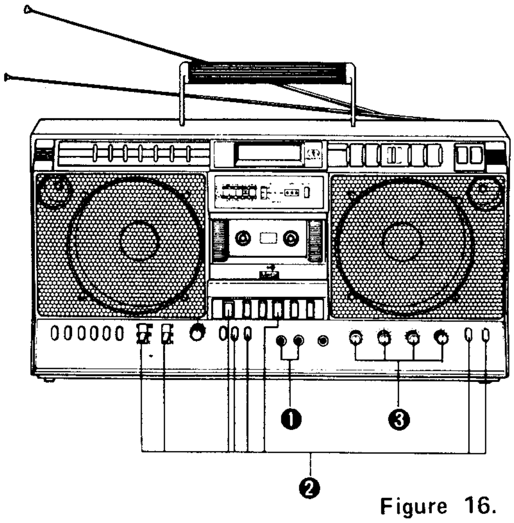


Figure 16.

<with radio>

❶ Connect the external mic. to [EXT MIC] jack ㊲.
❷ Tune to a radio station.
❸ Adjust volume, balance and tone.

<with other audio equipment>

❶ Connect the external mic. to [EXT MIC] jack ㊲, and MM type turntable to the [PHONO] jacks (53) and the [PHONO ⏚] terminal (54) and other equipment to the [DIN] jack socket (51).
❷ Set the [FUNCTION] switch ㉜ to the "PHONO" position when mixing with phonograph records, or to the "TAPE" position when the [DIN] jack (51) is connected.
❸ Set up the connected component for play.
❹ Adjust volume, balance and tone.

Recording

Mic mixing recording is possible only with equipment connected to the [DIN] jack (51) with a DIN cord.

3. DISASSEMBLY INSTRUCTIONS

FRONT PANEL REMOVAL

1. Remove 8 screws Ⓐ, Ⓑ and Ⓝ.
2. Remove the leads of speaker.
3. Separate the front panel from the cabinet.

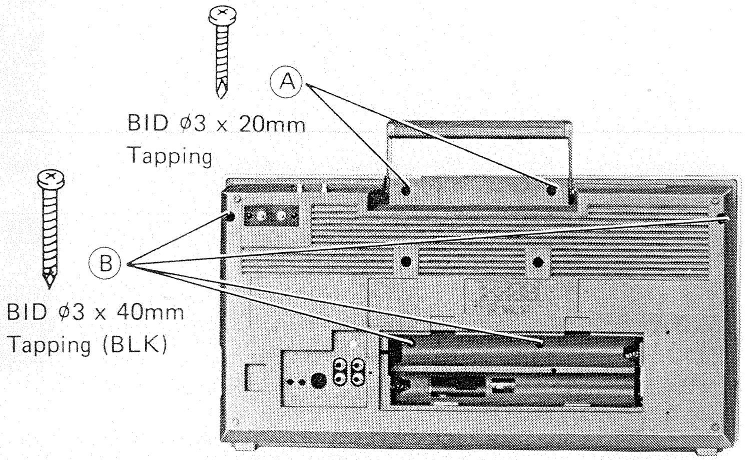

Ⓐ
BID ϕ3 x 20mm
Tapping
Ⓑ
BID ϕ3 x 40mm
Tapping (BLK)

Figure 17.

MECHANICAL ASS'Y REMOVAL

1. Remove 2 screws Ⓒ, and remove the lead wires Ⓓ. See Figure.
2. Separate the mechanical ass'y from the cabinet back.

P.C. BOARD REMOVAL

1. Remove 4 screws Ⓔ.
2. Separate the synthesizer P.C. Board from the cabinet back.
3. Remove 3 screws Ⓕ.
4. Separate the main P.C. Board and power P.C. Board.
5. Remove 3 screws Ⓖ.
6. Separate the jack P.C. Board from the cabinet back.
7. Restore 3 hooks Ⓜ.
8. Separate the LED P.C. Board from the frame.

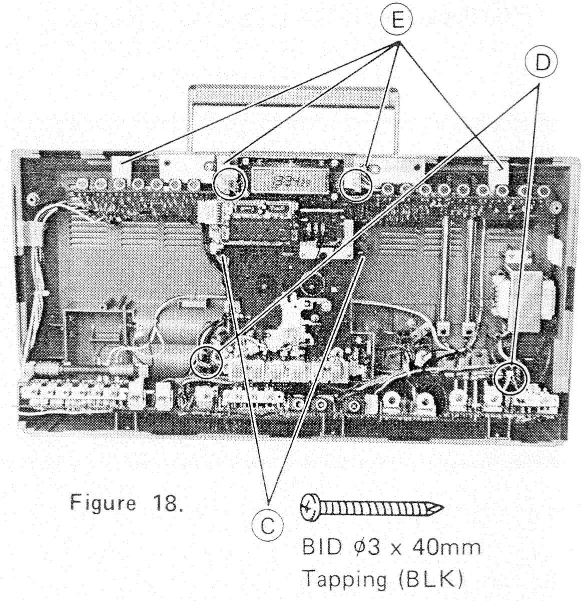

Ⓔ
Ⓓ
Ⓒ
BID ϕ3 x 40mm
Tapping (BLK)

Figure 18.

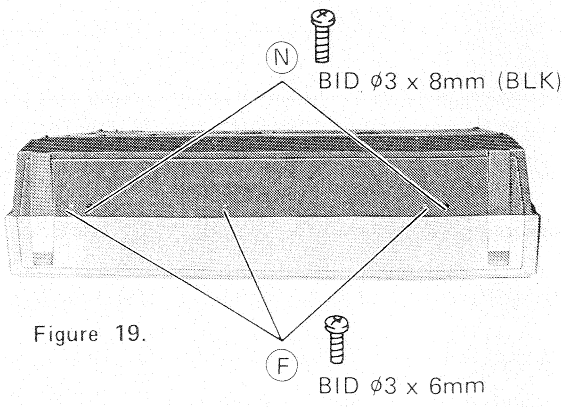

Ⓝ
BID ϕ3 x 8mm (BLK)
Ⓕ
BID ϕ3 x 6mm

Figure 19.

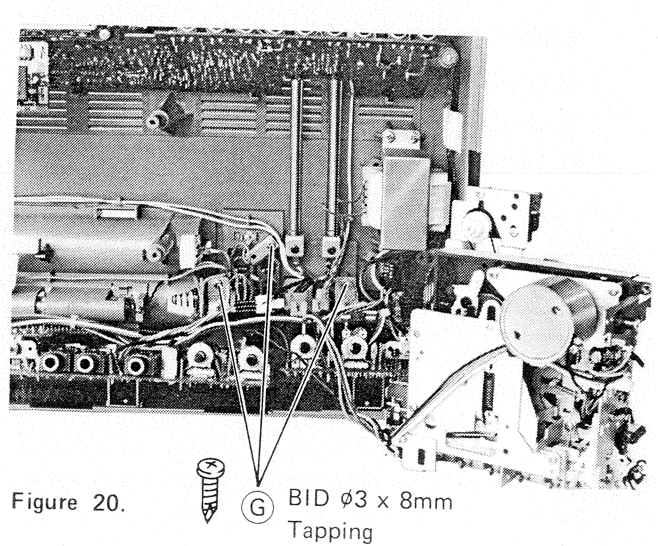
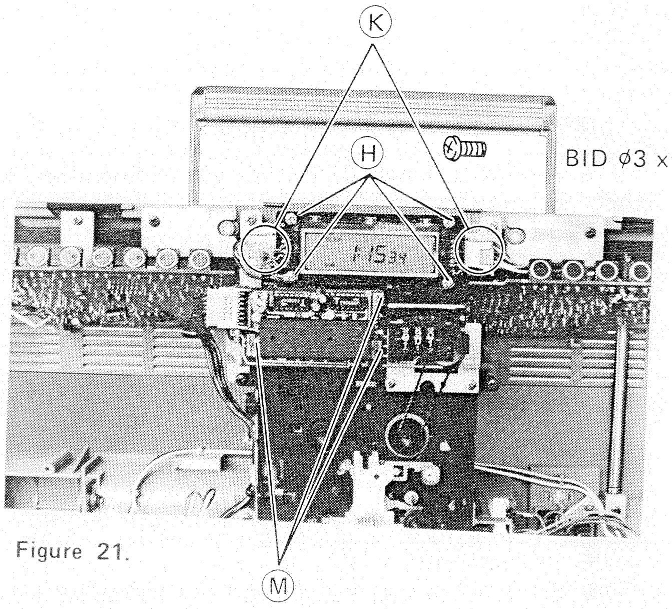


Figure 20.

BID ϕ3 x 8mm
Tapping

CLOCK ASS'Y REMOVAL

1. Remove 4 screws Ⓗ.
2. Remove 2 connectors Ⓚ.
3. Separate the clock ass'y from the frame.



BID ϕ3 x 6mm

Figure 21.

4. ALIGNMENT INSTRUCTIONS

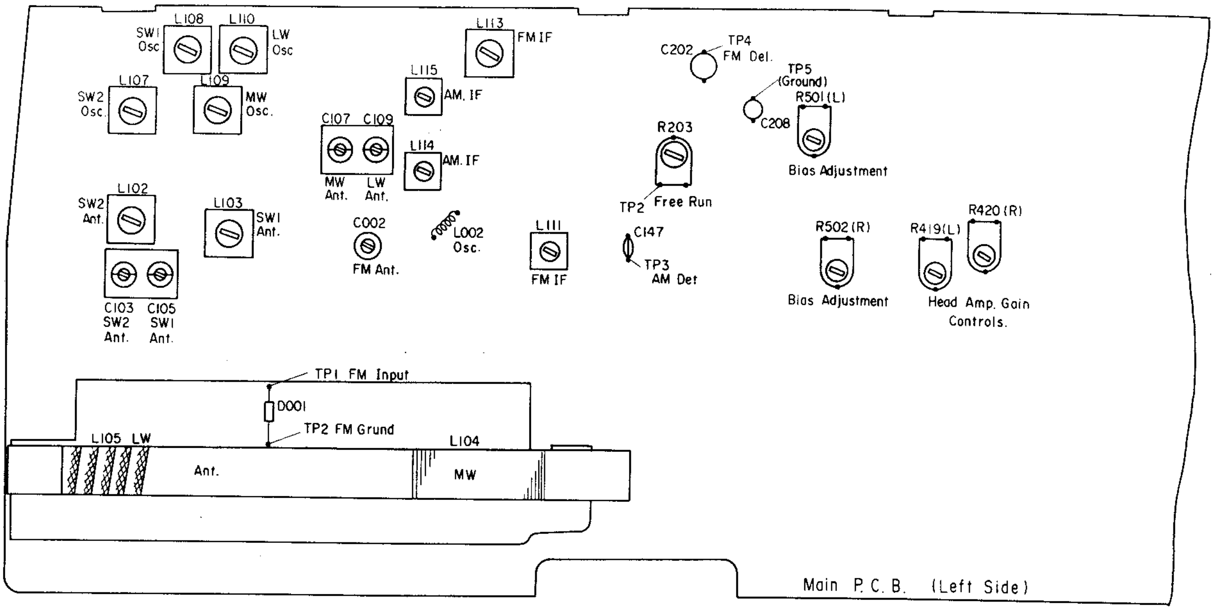

SW1 Osc
L108
L110
LW Osc
SW2 Osc.
L107
L109
MW Osc.
L113
FM IF
L115
AM. IF
C107
C109
MW Ant.
LW Ant.
L114
AM. IF
C202
TP4 FM Det.
TP5 (Ground)
R501 (L)
C208
R203
Bias Adjustment
TP2
Free Run
SW2 Ant.
L102
L103
SW1 Ant.
C002
FM Ant.
L002 Osc.
L111
FM IF
C147
TP3 AM Det
R502 (R)
Bias Adjustment
R419 (L)
R420 (R)
Head Amp. Gain Controls.
C103 SW2 Ant.
C105 SW1 Ant.
TP1 FM Input
D001
TP2 FM Grund
L105 LW
Ant.
L104
MW
Main P.C.B. (Left Side)

Figure 22.

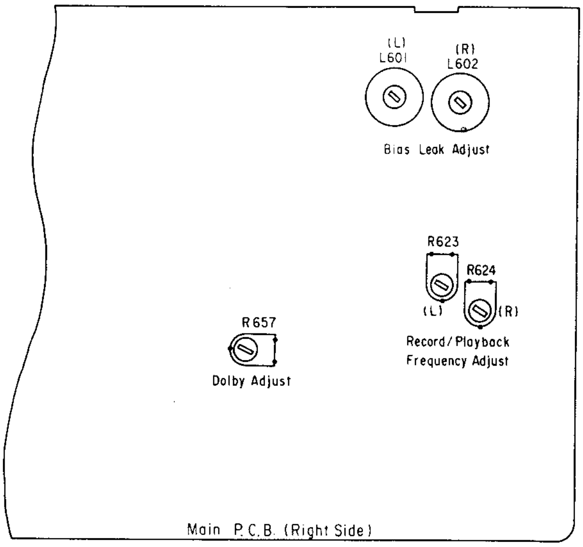

(L) L601
(R) L602
Bias Leak Adjust
R623
R624
(L)
(R)
Record/Playback Frequency Adjust
R657
Dolby Adjust
Main P.C.B. (Right Side)

Figure 23.

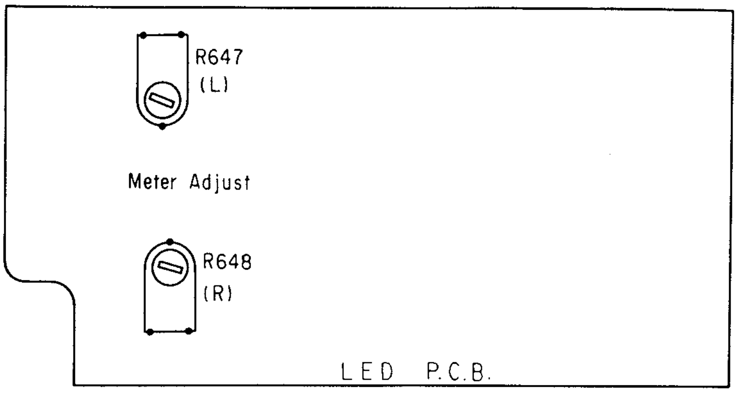

R647 (L)
Meter Adjust
R648 (R)
LED P.C.B.

Figure 24.

AM 4 Band (LW, MW, SW1, SW2) / ALIGNMENT

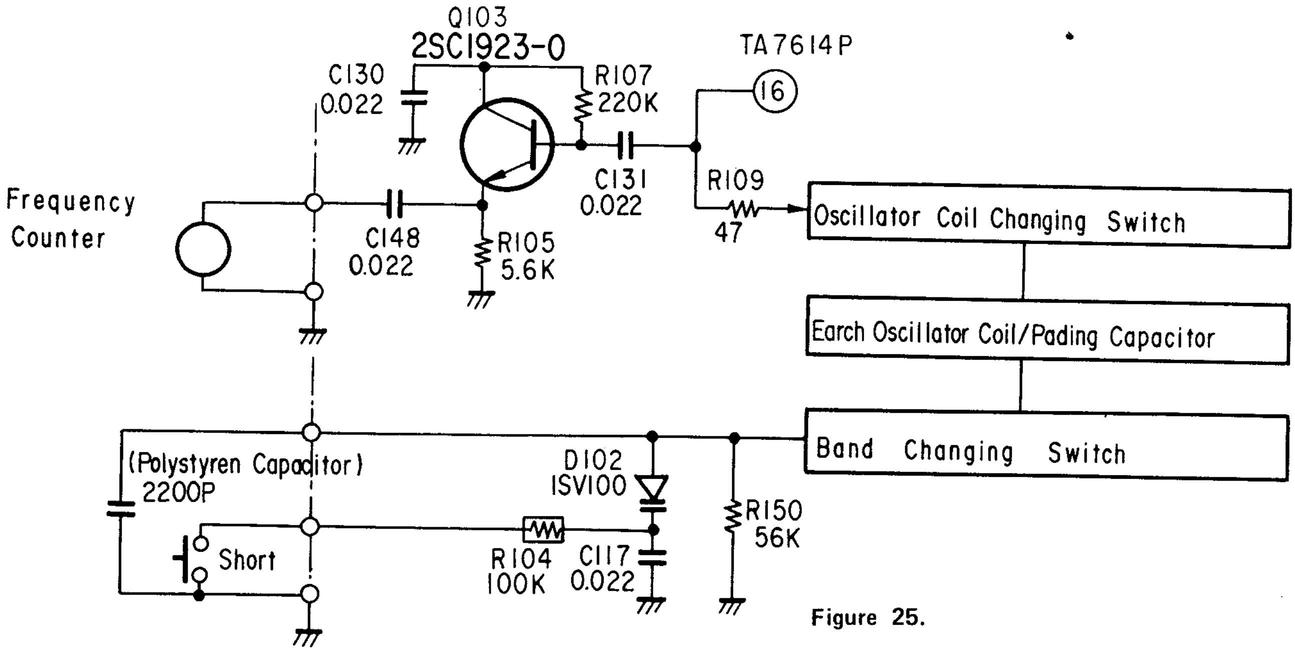

Q103
2SC1923-0
C130
0.022
R107
220K
TA7614P
16
C131
0.022
R109
47
Frequency
Counter
C148
0.022
R105
5.6K
Oscillator Coil Changing Switch
Earch Oscillator Coil/Pading Capacitor
Band Changing Switch
(Polystyren Capacitor)
2200P
Short
D102
ISV100
R104
100K
C117
0.022
R150
56K

Figure 25.

1. Open 9P socket assembly. (In this case, the display may become FM.)
2. Short-connect the supply side of VD to the ground, as shown in the drawing. Connect cap to 2200pF (polystyrene capacitor) ±5%. Adjust the frequency by adjusting the oscillator of each band.

Band	Display Frequency	Adjustment
LW	534 kHz	L110
MW	742 kHz	L109
SW1	1560 kHz	L108
SW2	3460 kHz	L107

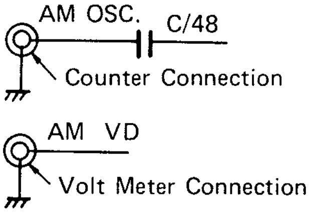

AM OSC.
C/48
Counter Connection
AM VD
Volt Meter Connection

Figure 26.

3. After the adjustment of the frequency, the readings of the voltmeter in the case when 2200pF and the short circuit are opened are close to the values in the following table.

Normal reception cannot be made if there is an abnormal voltage (11V or more) with Fmax. Adjust coil L107, L108 to shightly reduce voltage by 1.1V or 0.95V, then make certain the normal reception can be made with Fmin. and Fmax.

Band	VD (V)	
	Fmin.	Fmax.
LW	1	9
MW	1	9
SW1	1.1	9
SW2	0.95	9.5

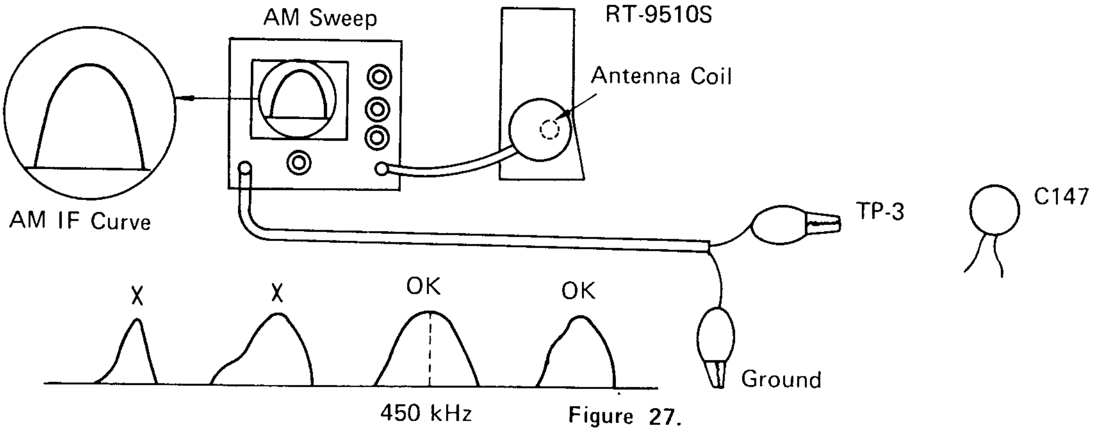

AM Sweep
RT-9510S
Antenna Coil
AM IF Curve
TP-3
C147
Ground
X
X
OK
OK
450 kHz

Figure 27.

TRUCKING ADJUSTMENT

Test equipments/Tools required

1. Signal generator
2. Oscilloscope
3. VTVM
4. FM/SW dummy antenna (75 ohm)
5. Network
6. Adjusting screwdriver
7. Adjusting bar
8. Dummy load resistor 3.2 ohms
9. Sweep generator
10. Test loop antenna
11. Frequency counter

Input (AM Signal Generator) 400 Hz 30% Modulation
Input (FM Signal Generator) 400 Hz 22.5 kHz Dev. (100%) Modulation
Antenna (75 ohm Unbalance Antenna)
Output Speaker Out (J003 or J004)
Dolby, High Blend ..... OFF Position

AM-IF ALIGNMENT

Step	Adjustment	Remarks
IF Response	L114 L115	Adjust for scop pattern with specified marker (460 kHz) as illustrated in Fig. 27.

AM-TRUCKING ALIGNMENT

Band	Step	Signal Generator Frequency	Connection		Display Frequency	Adjustment	Remarks
			Input	Output			
LW	1	146 kHz	Connect signal generator test loop.	Connect VTVM to J003 or J004	146 kHz	L105	Adjust for maximum
	2	281 kHz			281 kHz	C109	Adjust for maximum
	3	Repeat steps 1 and 2.					
MW	4	603 kHz	Connect signal generator test loop.	Connect VTVM to J003 or J004	603 kHz	ANT Coil L104	Adjust for maximum
	5	1404 kHz			1404 kHz	C107	Adjust for maximum
	6	Repeat steps 1 and 2.					
SW1	7	2.5 MHz	Connect signal generator test dummy (30 ohm)	Connect VTVM to J003 or J004	2.5 MHz	L103	Adjust for maximum
	8	5.5 MHz			5.5 MHz	L105	Adjust for maximum
	9	Repeat steps 7 and 8.					
SW2	10	6.5 MHz	Connect signal generator test dummy (30 ohm)	Connect VTVM to J003 or J004	6.5 MHz	L102	Adjust for maximum
	11	14 MHz			14 MHz	C103	Adjust for maximum
	12	Repeat steps 10 and 11.					

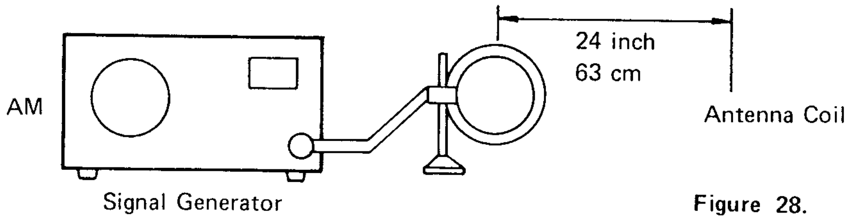
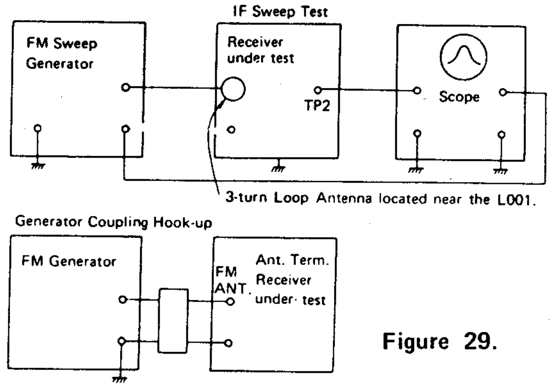


Figure 28.

FM-IF ALIGNMENT CHART

Step	Signal coupling	Equip.	Connection	Adjust. point	Pattern
1	Connect sweep generator output to a three-turn loop antenna of 10cm diameter.	Sweep generator of 10.7 MHz center freq. with 10.7 MHz marker.	Set scope for connecting output signal from TUN OUT to vertical axis of scope "V" and sweep generator output to horizontal axis "H"	L111 L113	Turn the coil L113 fully counterclockwise to obtain a single peak. Adjust coil L111 in order until the best single peak is obtained. Figure 30. Finally turn the coil L113 to obtain S curve. See figure 31.


IF Sweep Test
FM Sweep Generator
Receiver under test
TP2
Scope
3-turn Loop Antenna located near the L001.
Generator Coupling Hook-up
FM Generator
FM ANT.
Ant. Term. Receiver under test

See Figure 32.

Figure 29.

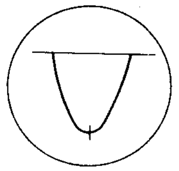


Figure 30.

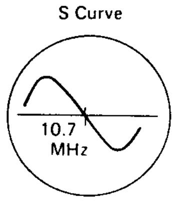
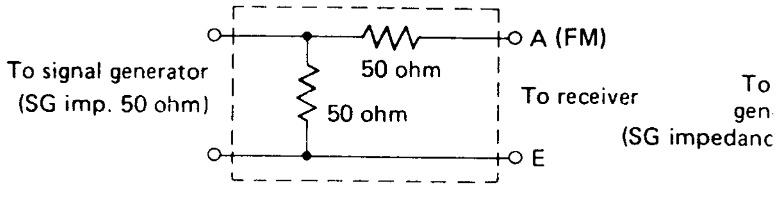

S Curve
10.7 MHz

Figure 31.

FM-RF ALIGNMENT CHART

Step	Signal Generator	Radio Dial Setting	A
1	90MHz	Tune to signal	A L
2	106 MHz		A C
3	Repeat steps 1 and 2 as required.		

CAUTION: When realigning the FM Receiving Frequency, th below 87.5 MHz in order to comply with FTZ reg


A (FM)
To signal generator
(SG imp. 50 ohm)
50 ohm
50 ohm
To receiver
E
To
gen
(SG impedanc

75 ohm dummy antenna Figure 32.

FREE RUN FREQUENCY ALIGNMENT

Adjust R204 under no signal condition so as to obtain 76 kHz

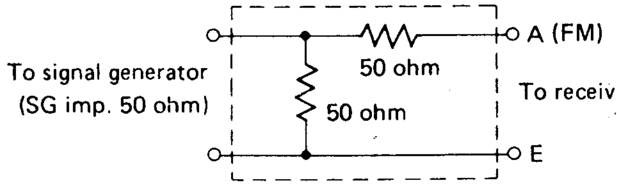
AMPLIFIER ALIGNMENT

Adjustment	Spec.	Using Tape	Recording	Rec. Volume	Function Switch	Dolby NR	Tape Change	Beat Play Mode	Input Point	Output Point	Adju Parts
Head Azimuth	L.R. Max.	MTT-114	–	–	Tape	Out	Normal	Stereo	–	Dolby Point	–
Bias Lead	Min.	–	Manual	Max.	Tape	Out	Metal	II	–	Dolby Point	R4 R4
Playback Sensitivity	775 ± 10 mV	MTT-150	–	–	Tape	Out	Normal	Stereo	–	Rec. Amp. Collector	L6 L6
Rec./PB Frequency Character	+1 dB ± 1 dB	AC-711	–	–	Tape	Out	Metal	Stereo	Mic. –80 dB 1K/10K	Dolby Point	R5 R5
Meter	–	MTT-150	–	–	Tape	Out	Normal	Stereo	–	Dolby Point	R6 R6
Record Sensitivity	775 ± 10 mV	AC-711	Manual	775 mV	Tape	Out	Metal	Stereo	Dolby Point	Dolby Point	R6 R6
Dolby	+8 dB	–	Manual	775 mV –30 dB	Tape	Out → In	–	Stereo	Mic. –50 dB 5K	Dolby Point	R6

FM-RF ALIGNMENT CHART

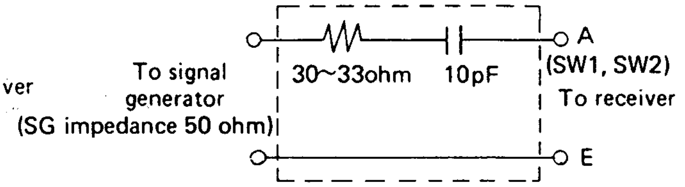
Step	Signal Generator	Radio Dial Setting	Adjustment	Remarks
1	90MHz	Tune to signal	Ant. Coil L002	Adjust for maximum output indication
2	106 MHz		Ant. Trim. C003	
3	Repeat steps 1 and 2 as required.			

CAUTION: When realigning the FM Receiving Frequency, the lowest side of the frequency range must not be below 87.5 MHz in order to comply with FTZ regulations in West Germany.



To signal generator
(SG imp. 50 ohm)
50 ohm
50 ohm
A (FM)
To receiver
E

75 ohm dummy antenna Figure 32.



To signal generator
(SG impedance 50 ohm)
30~33ohm
10pF
A
(SW1, SW2)
To receiver
E

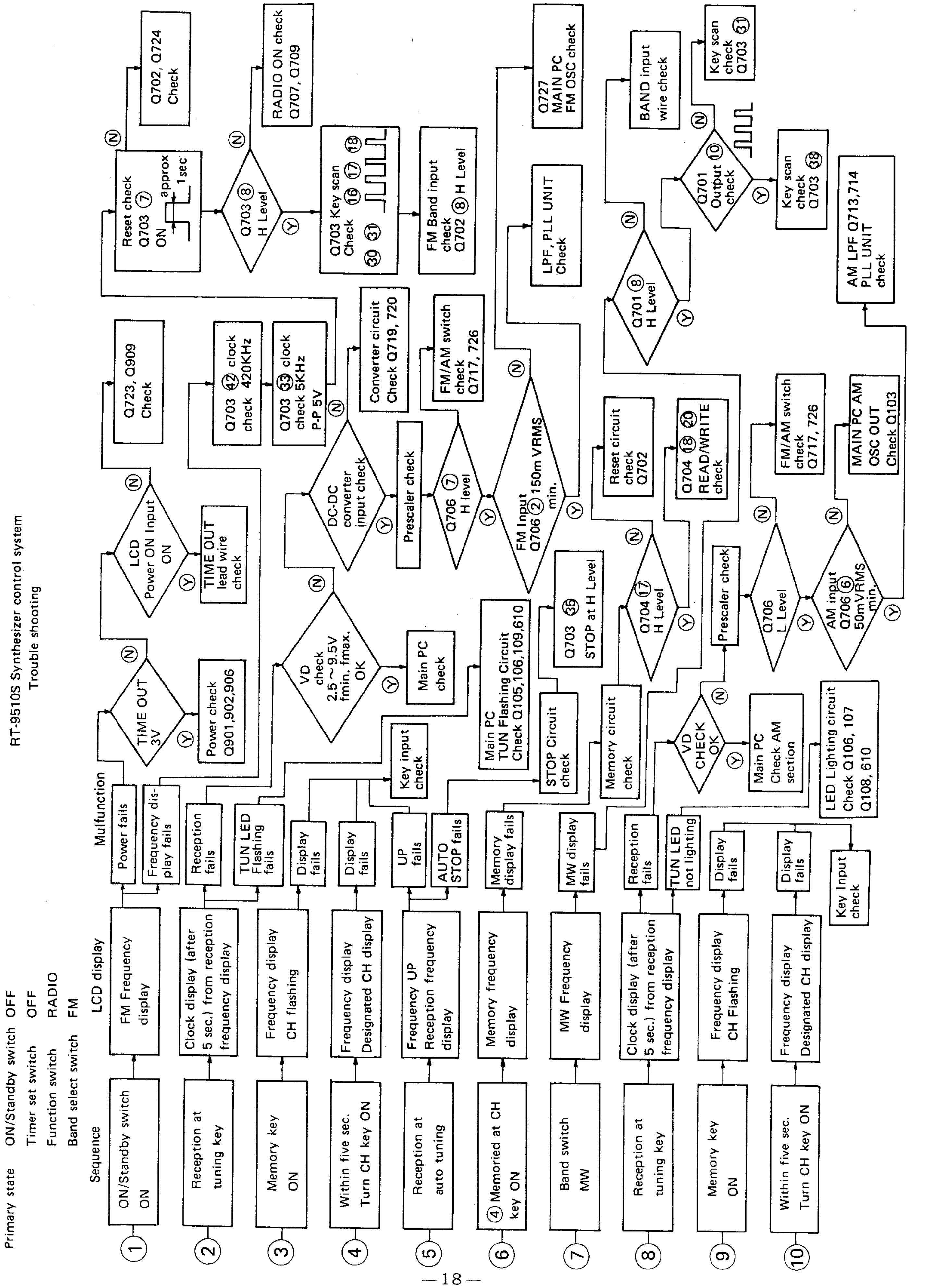
30 ohm dummy antenna Figure 33.

FREE RUN FREQUENCY ALIGNMENT

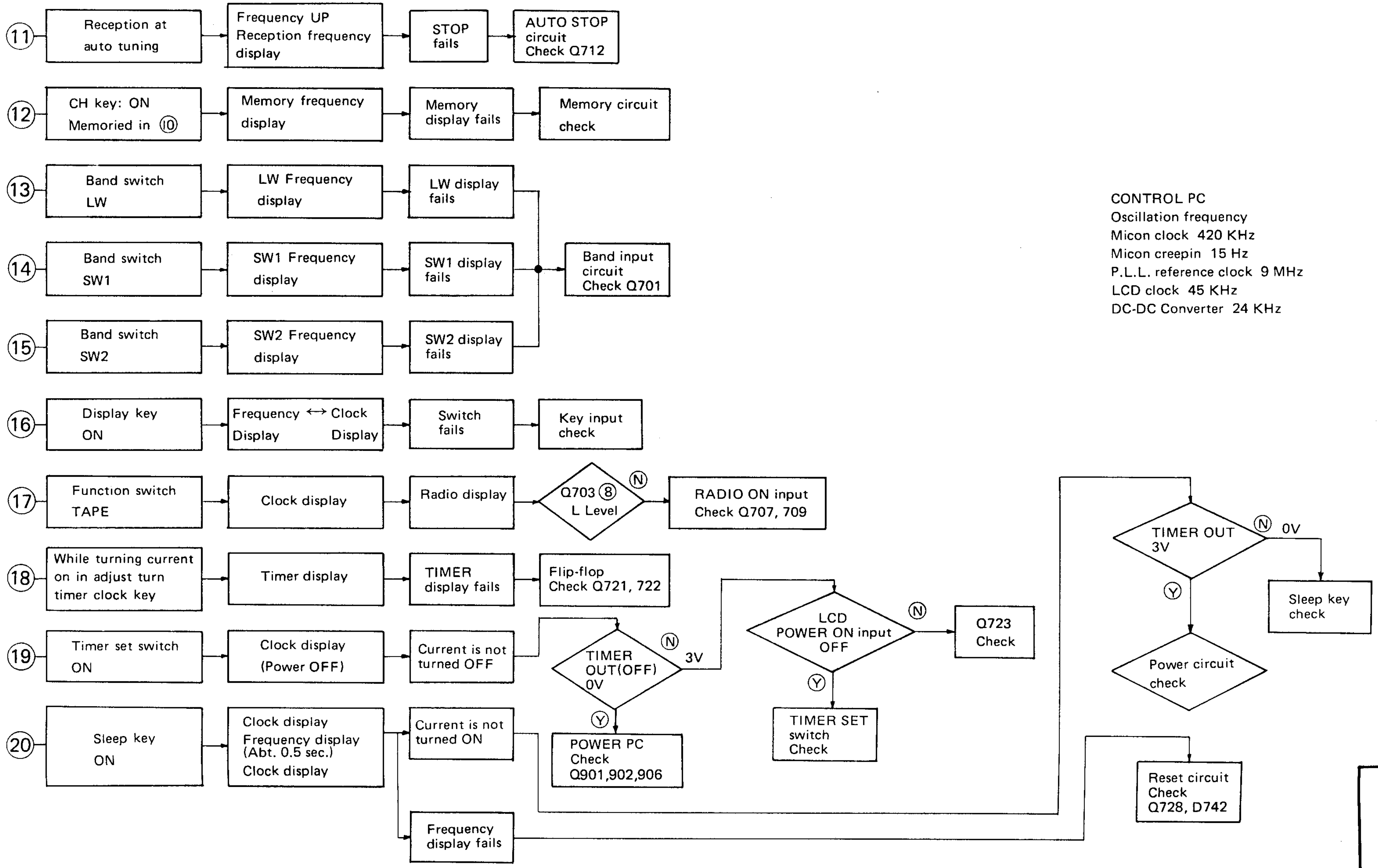
Adjust R204 under no signal condition so as to obtain 76 kHz ±150 Hz.

Dolby NR	Tape Change	Beat Play Mode	Input Point	Output Point	Adjusting Parts
Out	Normal	Stereo	–	Dolby Point	–
Out	Metal	II	–	Dolby Point	R419 R420
Out	Normal	Stereo	–	Rec. Amp. Collector	L601 L602
Out	Metal	Stereo	Mic. –80 dB 1K/10K	Dolby Point	R501 R502
Out	Normal	Stereo	–	Dolby Point	R647 R648
Out	Metal	Stereo	Dolby Point	Dolby Point	R623 R624
Out → In	–	Stereo	Mic. –50 dB 5K	Dolby Point	R657

5. TROUBLE SHOOTING



RT-9510S Synthesizer control system
Trouble shooting
Primary state
ON/Standby switch OFF
Timer set switch OFF
Function switch RADIO
Band select switch FM
Sequence
LCD display
Mulfunction
ON/Standby switch ON
FM Frequency display
Power fails
Frequency display fails
Reception at tuning key
Clock display (after 5 sec.) from reception frequency display
Reception fails
Memory key ON
Frequency display CH flashing
TUN LED Flashing fails
Within five sec. Turn CH key ON
Frequency display Designated CH display
Display fails
Reception at auto tuning
Frequency UP Reception frequency display
UP fails
AUTO STOP fails
④ Memoried at CH key ON
Memory frequency display
Memory display fails
Band switch MW
MW Frequency display
MW display fails
Reception at tuning key
Clock display (after 5 sec.) from reception frequency display
Reception fails
TUN LED not lighting
Memory key ON
Frequency display CH Flashing
Display fails
Within five sec. Turn CH key ON
Frequency display Designated CH display
Display fails
Key Input check
TIME OUT 3V
Power check Q901,902,906
LCD Power ON Input ON
TIME OUT lead wire check
Q723, Q909 Check
Reset check Q703 ⑦ ON approx 1sec
Q702, Q724 Check
Q703 ⑧ H Level
RADIO ON check Q707, Q709
Q703 Key scan Check ⑯ ⑰ ⑱ ㉚ ㉛
FM Band input check Q702 ⑧ H Level
Q703 ㊷ clock check 420KHz
Q703 ㉝ clock check 5KHz P-P 5V
Converter circuit Check Q719, 720
DC-DC converter input check
VD check 2.5~9.5V fmin. fmax. OK
Main PC check
Key input check
Prescaler check
Q706 ⑦ H level
FM/AM switch check Q717, 726
FM Input Q706 ② 150m VRMS min.
LPF, PLL UNIT Check
Q727 MAIN PC FM OSC check
Main PC TUN Flashing Circuit Check Q105,106,109,610
Q703 ㉟ STOP at H Level
STOP Circuit check
Memory circuit check
Reset circuit check Q702
Q704 ⑱ ⑳ READ/WRITE check
Q704 ⑰ H Level
Q701 ⑧ H Level
BAND input wire check
Q701 Output ⑩ check
Key scan check Q703 ㉛
Key scan check Q703 ㊳
VD CHECK OK
Main PC Check AM section
LED Lighting circuit Check Q106, 107 Q108, 610
Prescaler check
Q706 L Level
FM/AM switch check Q717, 726
MAIN PC AM OSC OUT Check Q103
AM input Q706 ⑥ 50mVRMS min.
AM LPF Q713,714 PLL UNIT check
Ⓝ
Ⓨ


⑪
Reception at auto tuning
Frequency UP Reception frequency display
STOP fails
AUTO STOP circuit Check Q712
⑫
CH key: ON Memoried in ⑩
Memory frequency display
Memory display fails
Memory circuit check
⑬
Band switch LW
LW Frequency display
LW display fails
⑭
Band switch SW1
SW1 Frequency display
SW1 display fails
Band input circuit Check Q701
⑮
Band switch SW2
SW2 Frequency display
SW2 display fails
⑯
Display key ON
Frequency ↔ Clock Display Display
Switch fails
Key input check
⑰
Function switch TAPE
Clock display
Radio display
Q703 ⑧ L Level
Ⓝ
RADIO ON input Check Q707, 709
⑱
While turning current on in adjust turn timer clock key
Timer display
TIMER display fails
Flip-flop Check Q721, 722
⑲
Timer set switch ON
Clock display (Power OFF)
Current is not turned OFF
TIMER OUT(OFF) 0V
Ⓝ
3V
Ⓨ
POWER PC Check Q901,902,906
LCD POWER ON input OFF
Ⓝ
Q723 Check
Ⓨ
TIMER SET switch Check
⑳
Sleep key ON
Clock display Frequency display (Abt. 0.5 sec.) Clock display
Current is not turned ON
Frequency display fails
TIMER OUT 3V
Ⓝ
0V
Sleep key check
Ⓨ
Power circuit check
Reset circuit Check Q728, D742

CONTROL PC
Oscillation frequency
Micon clock 420 KHz
Micon creepin 15 Hz
P.L.L. reference clock 9 MHz
LCD clock 45 KHz
DC-DC Converter 24 KHz

6. IC BLOCK DIAGRAM

MEASURING CIRCUIT/BLOCK DIAGRAM

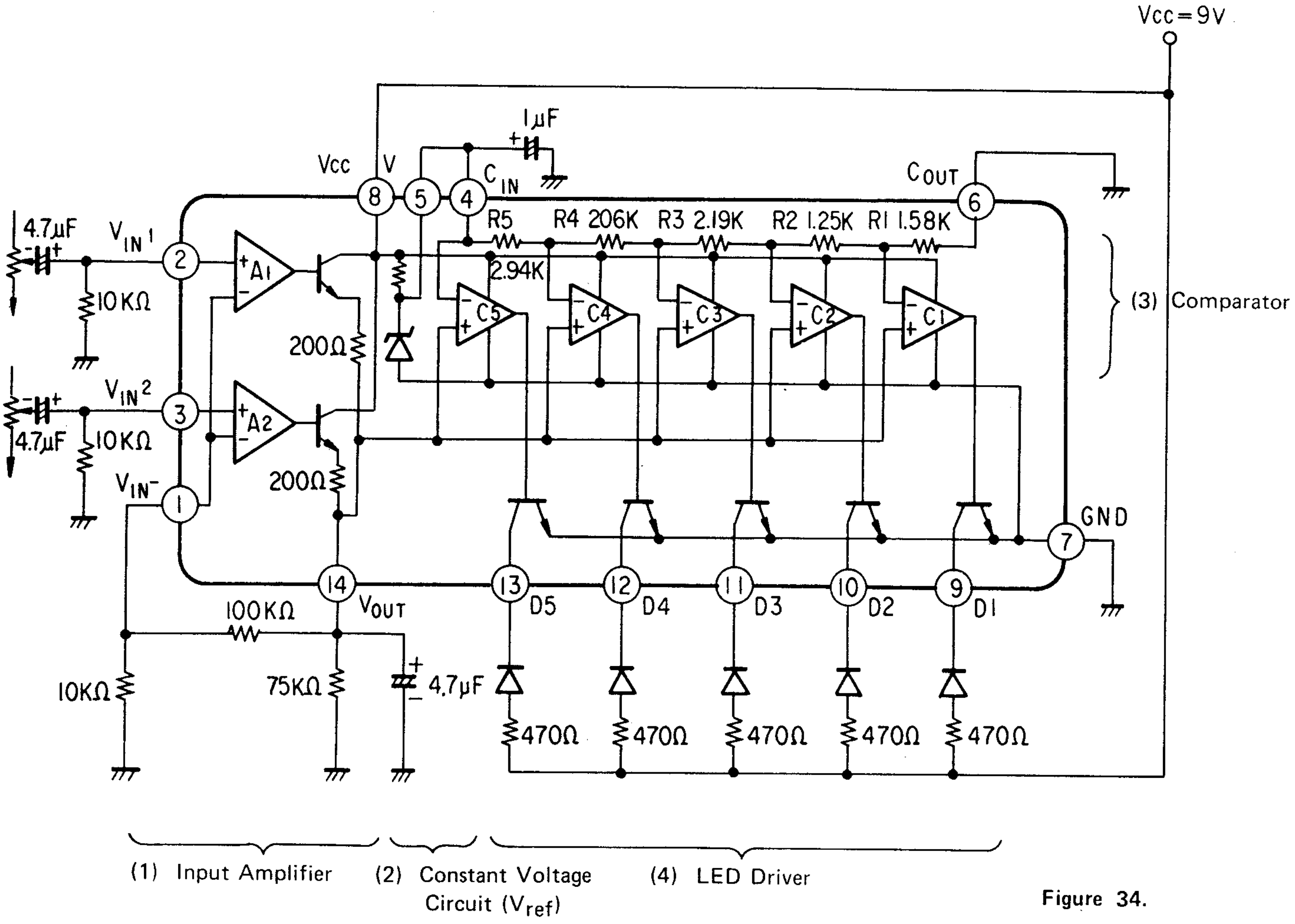

Vcc=9V
1µF
Vcc
V
CIN
COUT
8
5
4
6
R5
2.94K
R4 206K
R3 2.19K
R2 1.25K
R1 1.58K
4.7µF
VIN1
2
10KΩ
A1
A2
200Ω
200Ω
VIN2
3
4.7µF
10KΩ
VIN-
1
C5
C4
C3
C2
C1
(3) Comparator
GND
7
14
13
12
11
10
9
100KΩ
VOUT
D5
D4
D3
D2
D1
10KΩ
75KΩ
4.7µF
470Ω
470Ω
470Ω
470Ω
470Ω
(1) Input Amplifier
(2) Constant Voltage Circuit (Vref)
(4) LED Driver

Figure 34.

An Outline of the Internal Part of the IC

Functionally, the internal part may be divided into four: (1) input amplifier, (2) constant voltage circuit (V_{ref}), (3) comparator and (4) LED driver.

(1) Input Amplifier

The input amplifier operates as a differential amplifier. It can be equipped with the functions to amplify the signal which has become the emittor follower output, to detect the AC signal, or as a peak-holder.
There are two amplifiers. One with a larger input becomes the output.

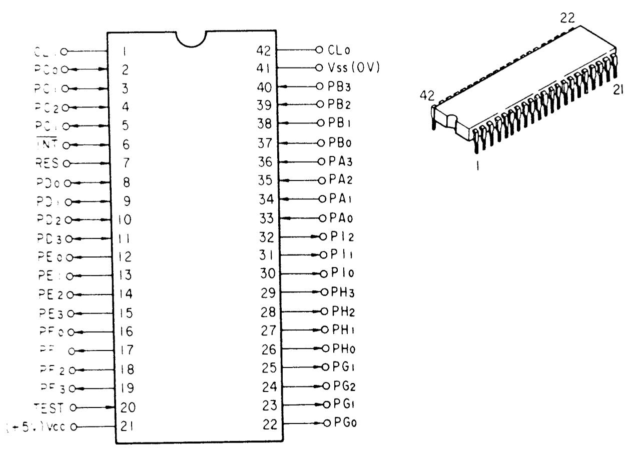
(2) Constant Voltage Circuit (V_{ref})

It has a reference voltage of 1.25V, which can be used as the reference voltage of the comparator. It is a zener diode but functions as a constant voltage circuit.

(3) Comparator

It consists of five comparators and a resistor for comparing lighting levels. In accordance with the output of the input amplifier, it drives the transistor used for the LED driver.

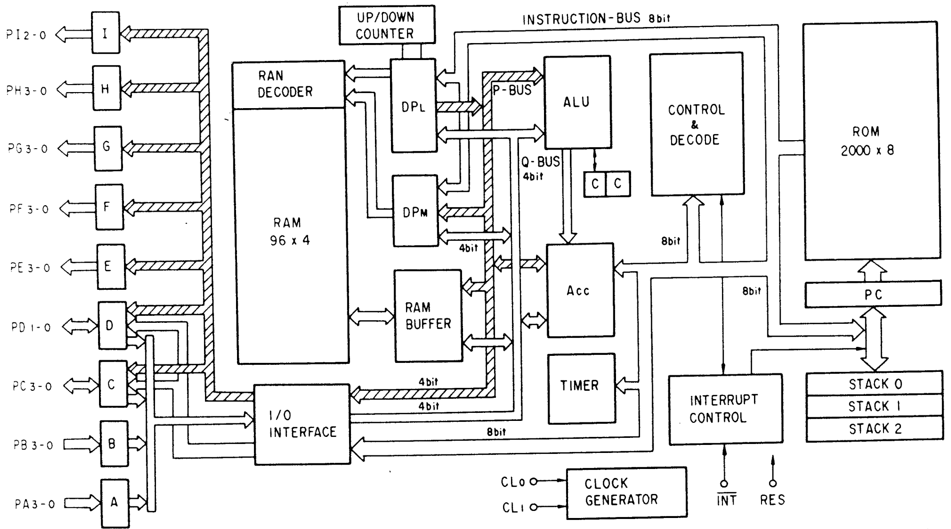
μPD650C062



TERMINALS

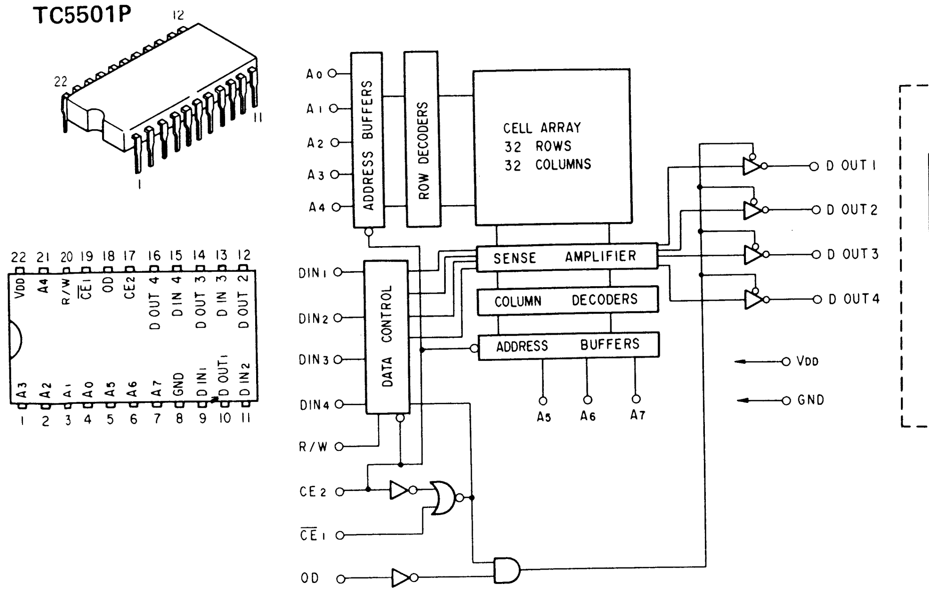
$CL_{0.1}$: For clock oscillation with LC outside
INT : Interrupt
RES : Reset
PA_{3-0} : Input port A_{3-0}
PB_{3-0} : Input port B_{3-0}
PC_{3-0} : In. Out. port C_{3-0}
PD_{3-0} : In. Out. port D_{3-0}
PE_{3-0} : Output port E_{3-0}
PF_{3-0} : Output port F_{3-0}
PG_{3-0} : Output port G_{3-0}
PH_{3-0} : Output port H_{3-0}
PI_{2-0} : Output port I_{2-0}
TEST : Test

μPD650C062



DP : Data point
ALU : Computing logic unit
Acc : Accumlator
PC : Program counter
C : Carrier F/F
C' : Carrier refuge F/F

TC5501P

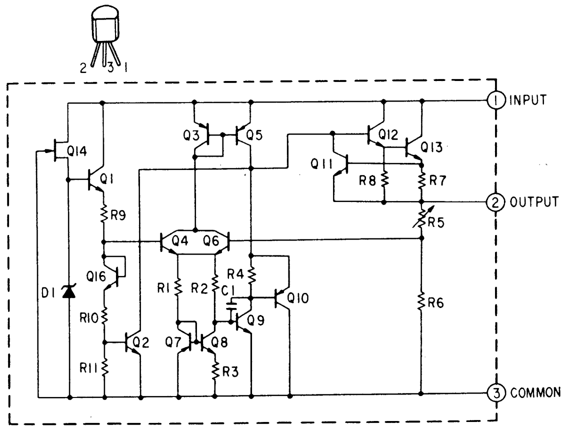


$A_0 \sim A_7$	ADDRESS INPUT
R/W	READ/WRITE INPUT
CE_1, CE_2	CHIP ENABLE
$DIN_1 \sim DIN_4$	DATA INPUT
$D\ OUT_1 \sim D\ OUT_4$	DATA OUTPUT
V_{DD}/GND	POWER SUPPLY
OD	OUTPUT DISABLE

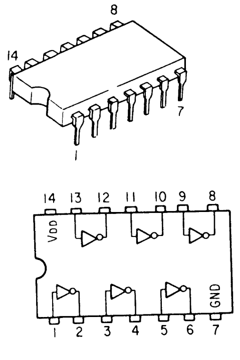
CE_1	CE_2	R/W	OD	DIN	$A_0 \sim A_7$	D OUT	OPERATION
H	*	*	*	*	Changing	High Impedance	Precharging
*	L	*	*	*	Changing	↑	Precharging
L	H	L	H	H/L	Stable	↑	Write "H/L"
L	H	L	L	H/L	Stable	READ H/L	Write/Read "H/L"
L	H	H	L	*	Stable	READ H/L	Read Cycle

* = "W" or "L"

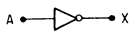
TA78L006AP



TC4069UBP



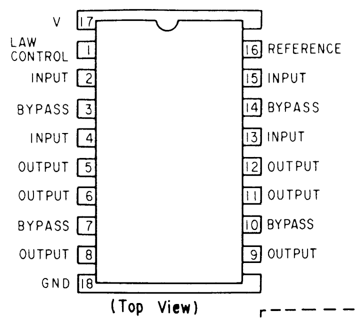
(1/6 TC-4069UBP)



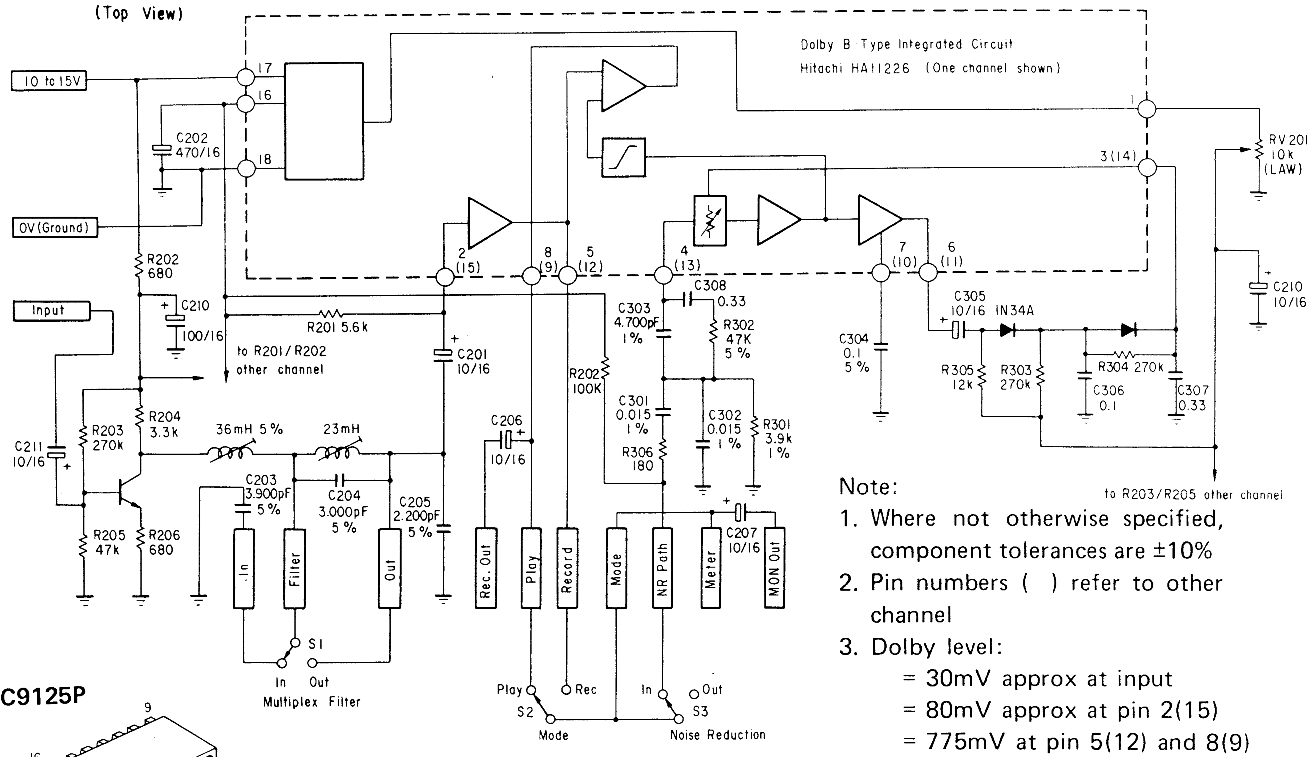
INPUT	OUT
A	X
L	H
H	L

PIN CONFIGURATION

HA11226



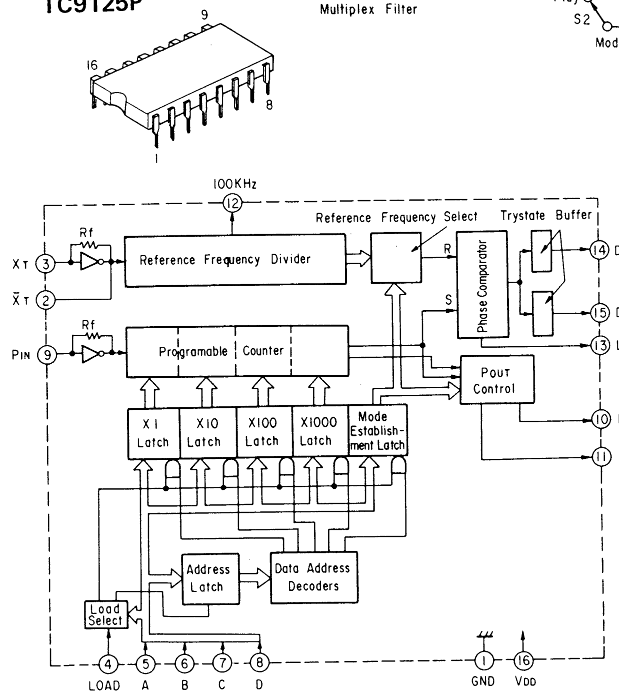
Note; Pin 2 to 8 for one channel, Pin 9 to 15 for the other channel and pin 1, 16, 17 and 18 common for both channels.



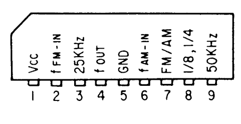
Note:

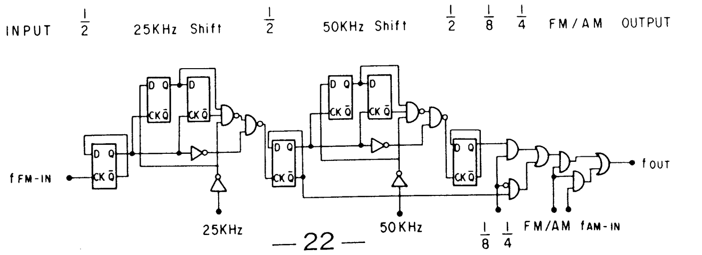
1. Where not otherwise specified, component tolerances are ±10%
2. Pin numbers ( ) refer to other channel
3. Dolby level:
   = 30mV approx at input
   = 80mV approx at pin 2(15)
   = 775mV at pin 5(12) and 8(9)

TC9125P

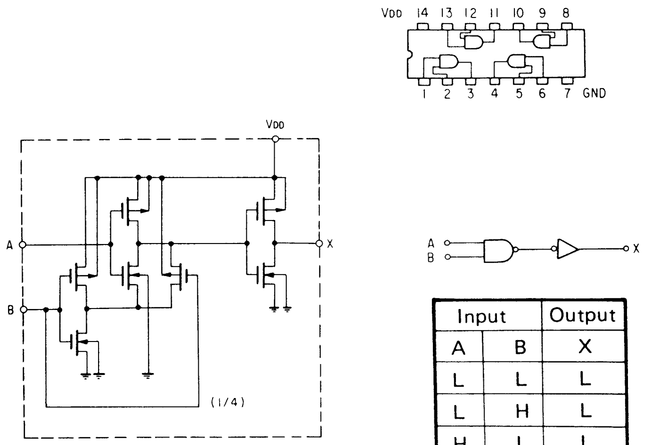


TD6102P





TC4081P



Input		Output
A	B	X
L	L	L
L	H	L
H	L	L
H	H	H

7. ELECTRICAL PARTS LOCATIONS

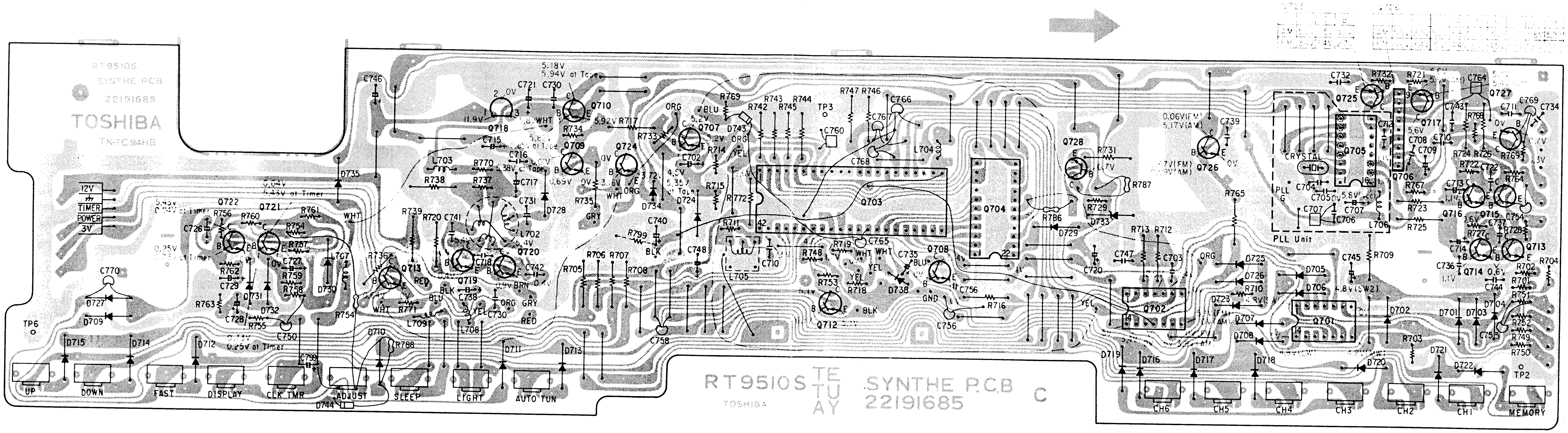
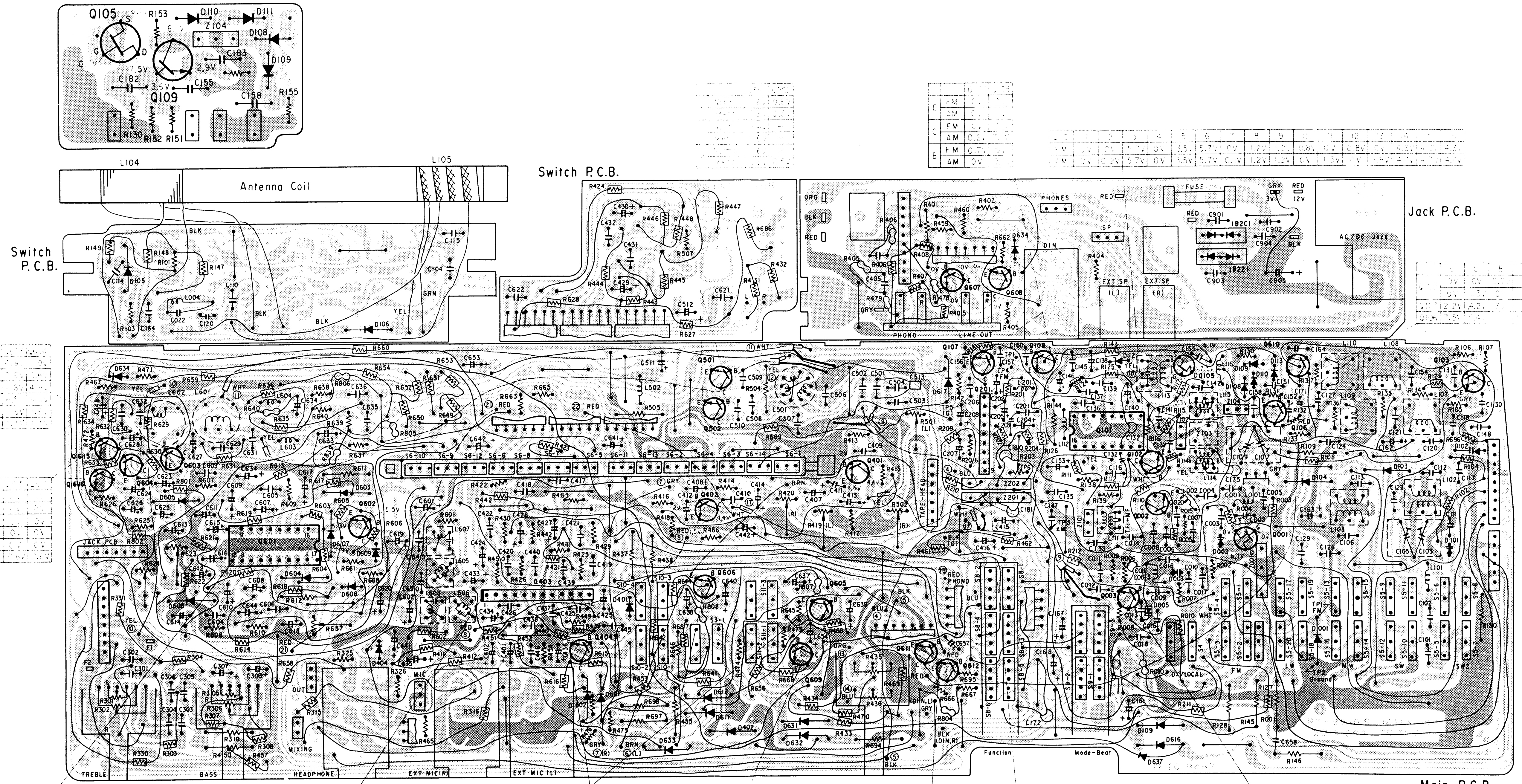

RT9510S
SYNTHE PCB
22191685
TOSHIBA
12V
TIMER
POWER
3V
TP6
TP3
TP2
UP
DOWN
FAST
DISPLAY
CLK TMR
ADJUST
SLEEP
LIGHT
AUTO TUN
CH6
CH5
CH4
CH3
CH2
CH1
MEMORY
CRYSTAL
PLL Unit
Q701
Q702
Q703
Q704
Q705
Q706
Q707
Q708
Q709
Q710
Q712
Q713
Q714
Q715
Q716
Q717
Q718
Q719
Q720
Q721
Q722
Q724
Q725
Q726
Q727
Q728
RT9510S
TOSHIBA
SYNTHE P.C.B
22191685
C

Figure 35.

	[illegible]	[illegible]
E	[illegible]	0.6V
	[illegible]	0.2V
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]

		[illegible]	[illegible]
E	FM	[illegible]	[illegible]
	AM	[illegible]	[illegible]
C	FM	[illegible]	[illegible]
	AM	0.2V	[illegible]
B	FM	0.7V	[illegible]
	AM	0V	[illegible]

[illegible]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FM	0V	0V	5.7V	0V	3.5V	5.7V	0V	1.2V	1.2V	0.8V	0V	0.8V	0V	4.3V	4.3V	4.3V
AM	0V	0.2V	5.7V	0V	3.5V	5.7V	0.1V	1.2V	1.2V	0V	1.3V	0V	1.9V	4.7V	4.7V	4.7V


Q105
R153
D110
D111
Z104
D108
D109
C183
C182
C155
Q109
C158
R155
R130
R152
R151
2.9V
3.6V
L104
L105
Antenna Coil
Switch P.C.B.
Switch P.C.B.
Jack P.C.B.
Main P.C.B.
PHONES
SP
FUSE
EXT SP (L)
EXT SP (R)
DIN
PHONO
LINE OUT
AC/DC Jack
GRY 3V
RED 12V
JACK PCB
TREBLE
BASS
HEADPHONE
EXT MIC(R)
EXT MIC (L)
MIXING
MIC
OUT
Function
Mode-Beat
FM
MW
LW
SW1
SW2
DX/LOCAL
TP1
TP2 Ground
Q101
Q601
Q403
Q201

	[illegible]		
E	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
C	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
B	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]

		[illegible]	[illegible]
E		[illegible]	[illegible]
		[illegible]	0V
C		[illegible]	0V
		0V	0V
B		0V	0V
	Pause	[illegible]	0.6V

	E	C	B	
[illegible]	0V	0V	[illegible]	FM
	0V	[illegible]	0V	AM
[illegible]	2.2V	4.2V	[illegible]	AM
Q106	7.5V	[illegible]		[illegible]

Q601	1	2	3	4	5	6	7	8	9
	0.5V	5.3V	1.3V	5.3V	5.3V	6V	1.7V	5.3V	5.3V
	10	11	12	13	14	15	16	17	18
	[illegible]	6V	5.3V	5.3V	[illegible]	5.3V	5.4V	10.8V	0V

Q403	1	2	3	4	5	6	7	8	9	10	11	12
	7V	3.7V	4.3V	1.2V	0V	0.65V	0V	0V	1.2V	0V	4.3V	3.7V

	Q404	Q605	Q606
E	0.2V	0V	0.7V
C	0.3V	4.25V	4.25V
B	0.7V	3.5V	1.35V

	Q609	
E	0V	Dolby Out
	0V	Dolby In
C	6V	Dolby Out
	0V	Dolby In
B	0V	Dolby Out
	0.7V	Dolby In

	Q611	Q612	
E	0V	0V	Radio
	0V	0V	Tape Phono
C	6.1V	0V	Radio
	0V	0.7V	Tape Phono
B	0V	0.7V	Radio
	0.7V	0V	Tape Phono

Q201	1	2	3	4	5	6	7	8	9
	4V	4.7V	6.1V	5.2V	0V	5.9V	5.8V	2.6V	2.6V

	E	C	B
Q002	0.9V	6.2V	1.55V
Q003	0.6V	3.8V	1.4V

Figure 36.

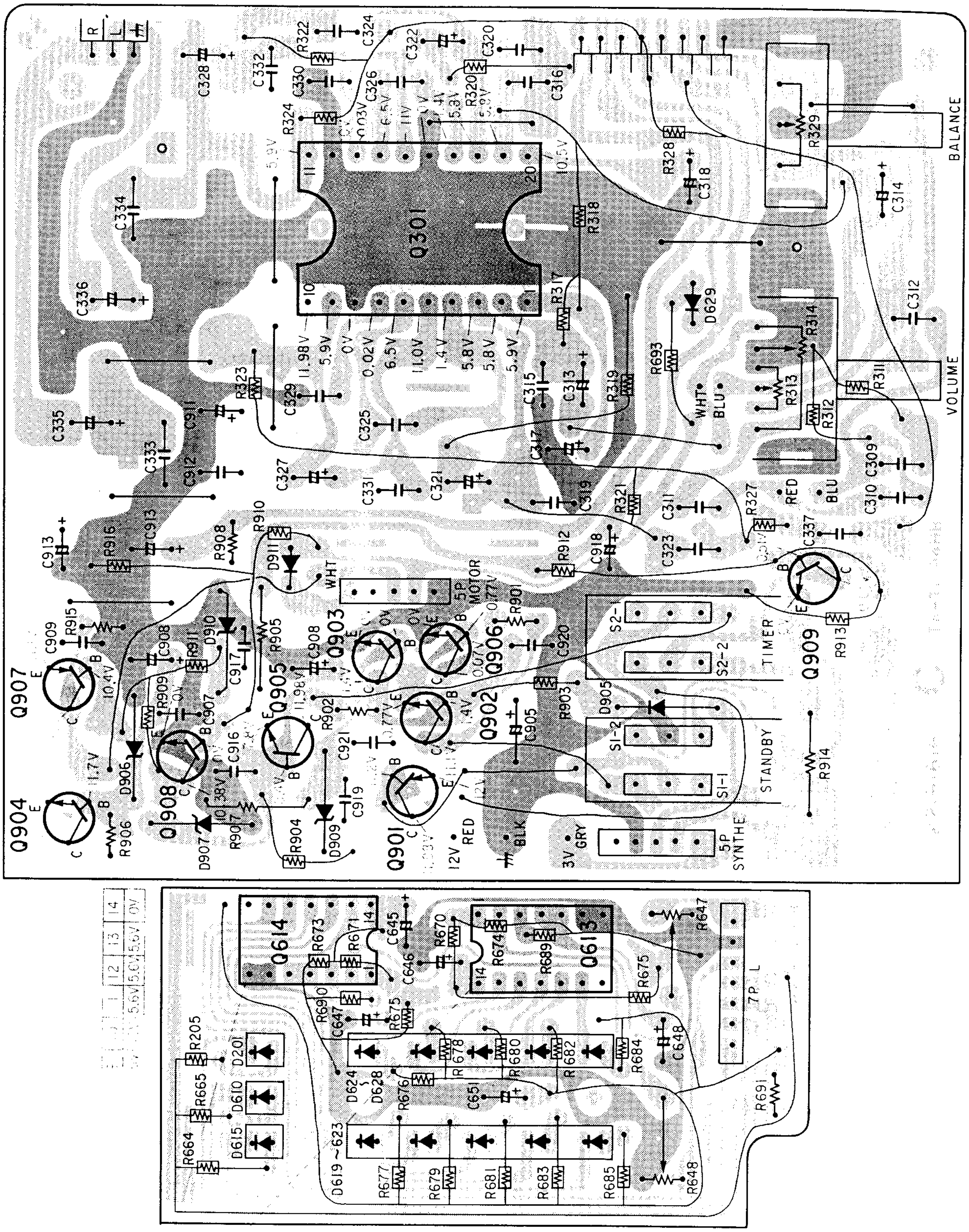

Q301
Q901
Q902
Q903
Q904
Q905
Q906
Q907
Q908
Q909
Q613
Q614
BALANCE
VOLUME
TIMER
STANDBY
S1-1
S1-2
S2-1
S2-2
5P MOTOR
5P SYNTHE
7P L
WHT
BLU
RED
BLK
GRY
12V
3V
R329
R314
R311
R312
R313
D629
D905
D906
D907
D909
D910
D911
D201
D610
D615
D619~623
D624 ~ D628
R647
R648
R691
C648
C645
C646
C647
C651

Figure 37.

8–1. MECHANISM EXPLODED VIEW (UPPER)

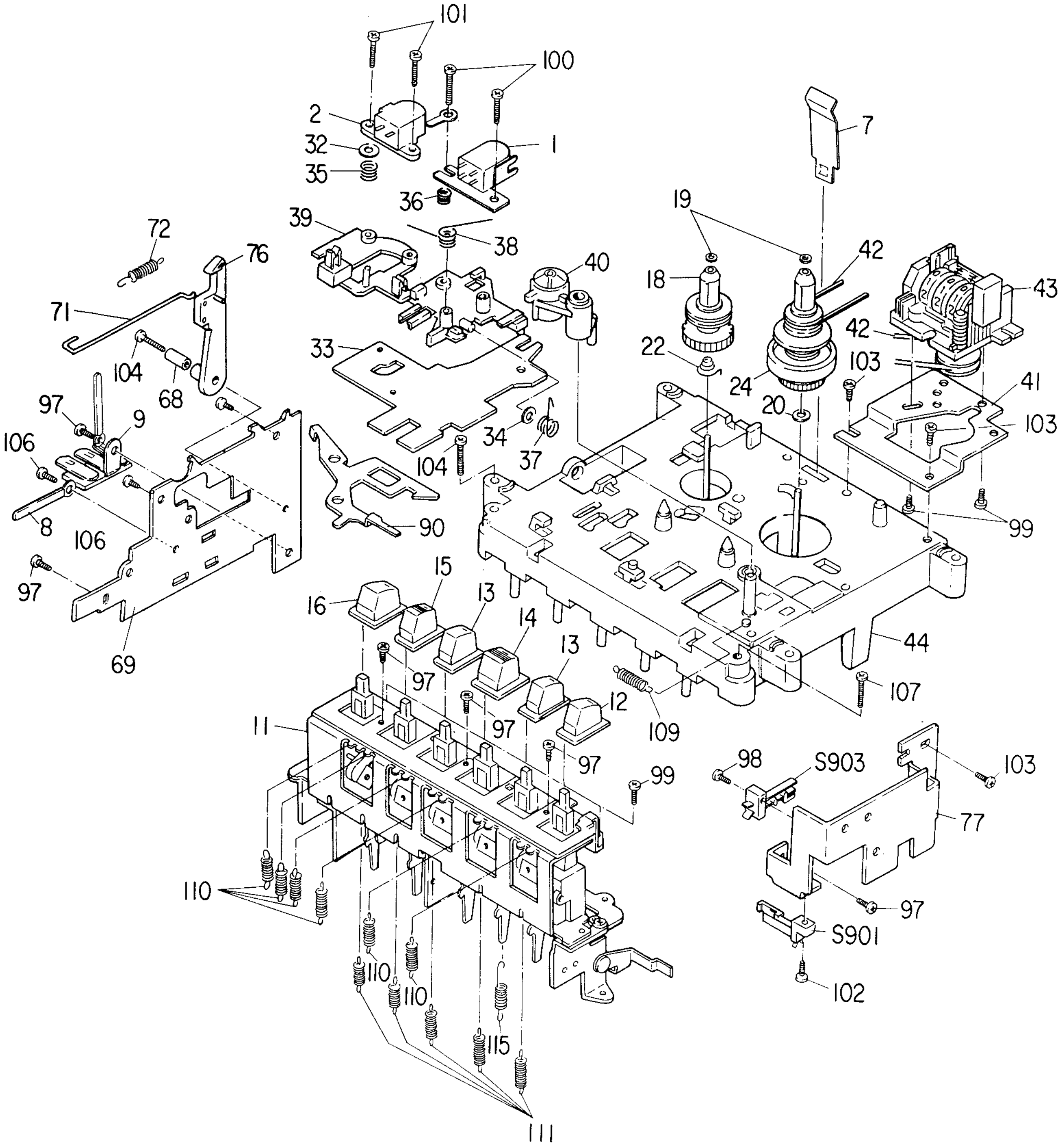

101
100
2
32
35
1
36
7
39
38
19
72
76
40
42
43
18
71
22
42
104
33
103
24
41
97
68
9
20
103
106
34
37
104
8
90
99
106
97
15
16
13
14
44
13
69
97
12
107
11
97
109
97
98
S903
103
99
77
110
97
S901
110
110
102
115
111

Figure 38.

NOTE: Excluded parts in the Parts List are not available as replacement parts.

8–2. MECHANISM EXPLODED VIEW (LOWER)

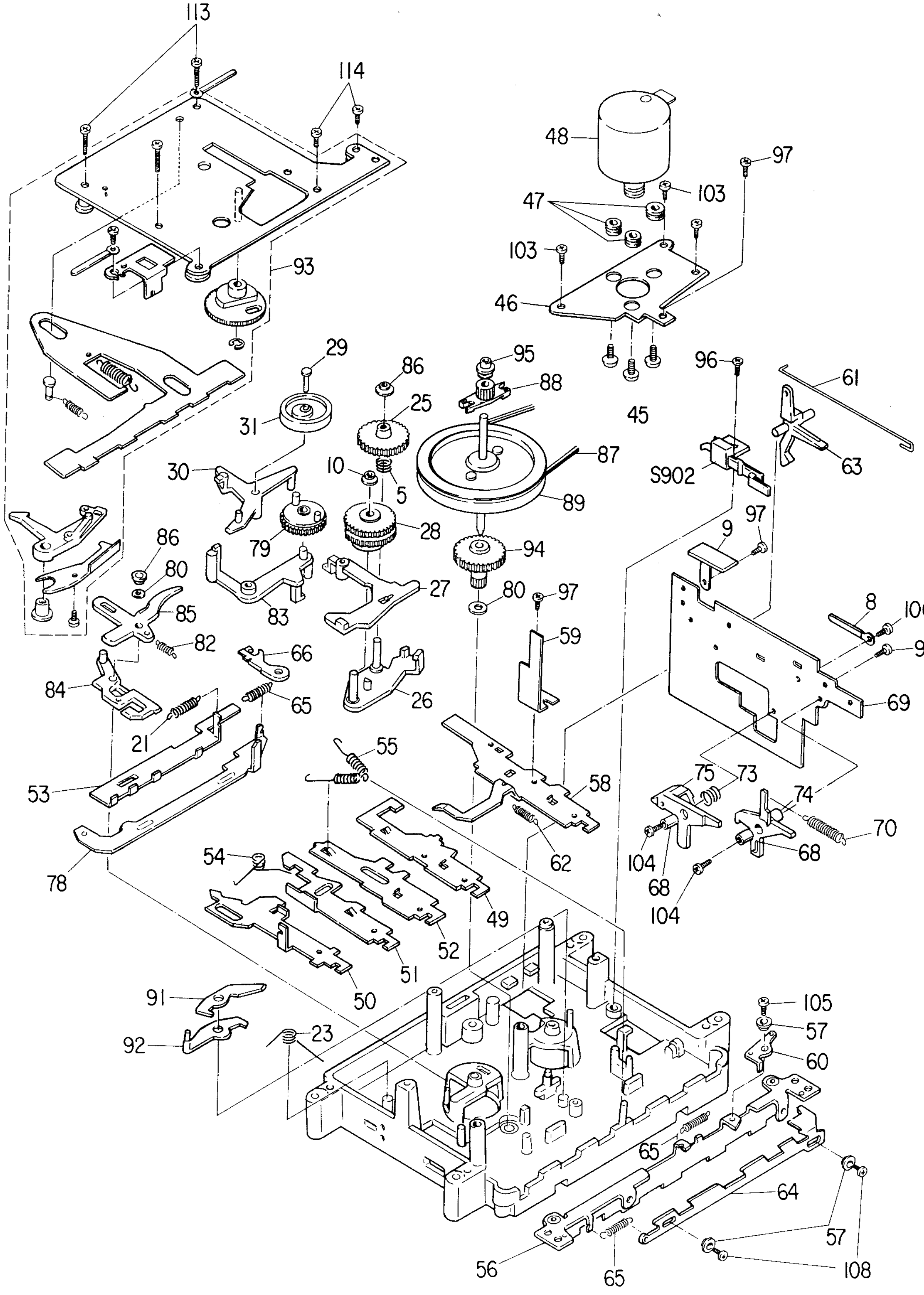

113
114
48
97
103
47
103
93
46
29
86
95
88
96
61
25
31
45
87
63
30
10
5
S902
89
86
79
28
9
97
94
80
27
80
97
8
106
83
85
59
97
82
66
84
26
69
65
21
55
53
58
75
73
74
70
62
104
68
54
78
68
104
49
52
51
50
91
105
23
57
92
60
65
64
57
56
65
108

Figure 39.

NOTE: Excluded parts in the Parts List are not available as replacement parts.

9. CABINET EXPLODED VIEW

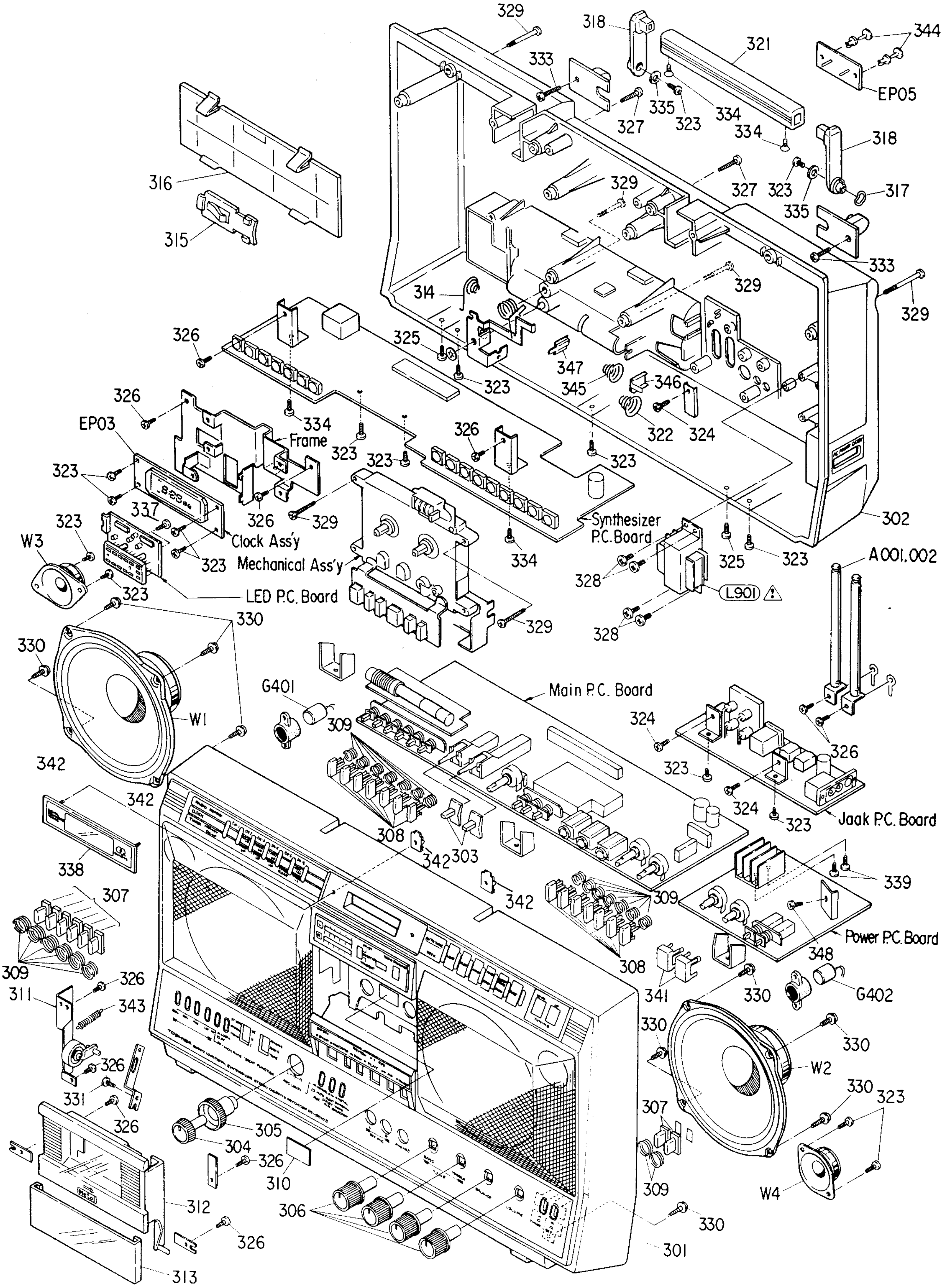

329
318
321
344
333
335
327
323
334
334
EP05
318
316
315
329
327
323
335
317
333
329
329
314
326
325
347
345
346
323
326
334
EP03
Frame
323
323
326
322
324
323
323
337
326
329
Synthesizer P.C. Board
302
W3
323
Clock Ass'y
323
Mechanical Ass'y
334
325
323
A001,002
328
L901
323
LED P.C. Board
330
329
328
330
W1
G401
309
Main P.C. Board
324
326
342
342
323
324
323
Jaak P.C. Board
308
303
342
338
342
309
339
307
Power P.C. Board
348
309
326
308
341
330
G402
311
343
330
330
326
W2
331
326
307
330
323
305
304
326
310
309
W4
312
306
330
326
301
313

Figure 40.

10. PARTS LIST

CAUTION : The ⚠ mark, the symbol No. circled with rectangle in the schematic diagram and the shaded area in the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

Symbol No.	Part No.	Description
MECHANISM		
1	22217362	Head, Record/Playback, HRPT-80
2	22218231	Head, Erase, HET-53
5	25772584	Spring, Spacer
6	25771603	Spring
10	25783226	Bushing
11	25791360	Operation Plate Ass'y
12	25837489	Button, Pause
13	25837490	Button, FF/REW
14	25837491	Button, Play
15	25837492	Button, Record
16	25837493	Button, Stop
18	25754338	Hub Plate, Supply
19	25764549	Washer, ø1.7
20	25764566	Washer, ø2
21	25771617	Spring
22	25772578	Spring, Compression
23	25773442	Spring, Idler
24	25712367	Hub Plate, Take-up
25	25756179	High-speed Gear A
26	25782251	Lever, Take-up
27	25782252	Lever, Fast Forward
28	25719491	High-speed Gear Ass'y B
31	25791350	Take-up Idler Ass'y
32	22703281	Washer, ø2.6
34	25764550	Washer, ø3.6
35	25772579	Spring, Erase Head
36	25772585	Spring, Azimuth Adjusting
37	25773531	Spring, Head Slider
38	25773532	Spring, Pressure Roller
39	25783225	Head Mount
40	25717466	Pressure Roller
42	25755387	Belt, Counter
43	25873238	Tape Counter
45	22707429	Screw, Special, ø2.6 x 4.9mm, Motor
47	25761238	Cushion, Motor
48	25791261	Motor Ass'y
51	25741757	Operation Plate, FF
52	25741787	Operation Plate, Play C
54	25773515	Spring, Operation Plate A
55	25776231	Spring
57	25726610	Bushing
58	25741546	Operation Plate, Record
62	25776229	Spring
63	25782401	Lever, Record Lock
65	25771780	Spring
66	25782400	Lever, Pause Lock
67	25741836	Operation Plate, REW
68	25733504	Spacer
72	25776175	Spring
73	25777022	Spring, Up Lever
74	25782402	Lever, Stop
75	25782403	Lever, Up
76	25782404	Lever, Eject
79	25756247	Gear, ASO
80	25764398	Washer, ø2.5
82	25776043	Spring, ASO
83	25782247	Lever, ASO
84	25782332	Lever, Detect
85	25782333	Lever, Swing
86	25783195	Bushing
87	25755297	Belt, Drive
88	25756235	Gear, Flywheel
89	25717468	Flywheel Ass'y
91	25782250	Lever, Review
92	25782294	Lever, Cue
94	25751579	Gear, Flywheel
95	25725340	Holder, Flywheel
96	22701326	Screw, BID ø3 x 8mm, Tapping
97	22707350	Screw, DTBID ø2.6 x 5mm
98	22707368	Screw, DTBID ø2.6 x 10mm
99	22707300	Screw, BID ø2.6 x 6mm, Tapping
100	22707322	Screw, DTBID ø2 x 10mm
101	22707602	Screw, DTBID ø2 x 10mm
103	22707301	Screw, BID ø2.6 x 8mm, Tapping
104	22707535	Screw, BID ø2.6 x 12mm
105	22707265	Screw, BID ø2 x 4mm
109	25771610	Spring
110	25776238	Spring, Operation Plate
111	25776239	Spring, Operation Plate
113	22707320	Screw, BID ø2.6 x 14mm, Tapping
114	22707367	Screw, DTBID ø2.6 x 8mm
115	25776284	Spring
CABINET PARTS		
301	25881080	Cabinet Front Ass'y
302	25881081	Cabinet Back Ass'y
303	22835165	Knob, Lever
304	25837470	Knob A
305	25837471	Knob B

Symbol No.	Part No.	Description
306	25837480	Knob, Tone, Balance, Volume
307	22835033	Knob, Push
308	22884040	Knob G, Key Switch
309	25772466	Spring, Push Switch
310	25824247	Reflector, Cassette Lid
311	22749282	Dumper Ass'y
312	25817926	Cassette Cover Ass'y
313	25838535	Clear Cover, Cassette Lid
314	25773349	Spring, Battery
315	25811185	Cover Ass'y , Battery
316	25838546	Cover, Battery
317	22840065	Washer, Handle
318	25835430	Crank, Handle
321	25835433	Holder, Handle
322	25772477	Spring, Minus, Battery
323	22707066	Screw, BID ϕ3 x 6mm
324	22707327	Screw, BID ϕ3 x 8mm, Tapping
325	22701325	Screw, BID ϕ3 x 8mm, BLK
326	22707118	Screw, BID ϕ3 x 12mm, Tapping
327	22707054	Screw, BID ϕ3 x 20mm, Tapping
328	22707472	Screw, BID ϕ4 x 12mm, Tapping
329	22707578	Screw, BID ϕ3 x 40mm, Tapping, BLK
330	22701434	Screw with Washer, TPAN ϕ3 x 10mm
331	22707323	Screw, BID ϕ2.6 x 8mm
333	22707276	Screw, BID ϕ3 x 16mm, Tapping
334	22701348	Screw, FLT ϕ3 x 8mm
335	22703269	Washer, ϕ3
336	22701325	Screw, BID ϕ3 x 8mm
337	22707303	Screw, BID ϕ2.6 x 10mm, Tapping
338	25828735	Decoration, LCD
339	22707163	Screw, BID ϕ3 x 10mm
340	25828576	Caution Plate
341	22884039	Knob, Key Switch
342	25779127	Push Nut
343	25776212	Spring, Up
344	22705022	Plastic Rivet, ϕ3 x 5.5mm
345	22774506	Spring, Cabinet Back
346	25839186	Plate, Battery
347	25839202	Plate, Battery

TRANSISTORS, ICS & DIODES

Symbol No.	Part No.	Description
Q001, 105		Transistor, 2SK61-O
Q002, 003, 103, 109, Q727		Transistor, 2SC1923-O
Q101		I.C., TA7614AP-Y
Q102, 501, 502, 607, 608, 615, 616		Transistor, 2SC1959-Y
Q106, 707, 712, 717, 723, 724, 725		Transistor, 2SA1015-GR
Q107, 108, 404, 602, 603, 604, 605, 606, 609, 610, 611, 612, 708, 709, 713, 714, 715, 716, 719, 720, 722, 726, 728, 902, 903, 906, 908, 909		Transistor, 2SC1815-GR
Q201		I.C., TA7323P-O
Q301		I.C., TA7229P
Q401, 402		Transistor, 2SC732TM-BL
Q403		I.C., TA7328AP
Q601	22114624	I.C., HA11226
Q613, 614		I.C., TA7654P
Q701		I.C., TC4081-BP
Q702		I.C., TC4069μBP
Q704		I.C., TC5501P
Q705		I.C., TC9125P
Q706		I.C., TD6102P
Q710		Transistor, 2SA562TM-O/Y
Q718		I.C., TA78L006AP
Q901		Transistor, 2SA1012-Y
Q904		Transistor, 2SC2655-Y
Q905		Transistor, 2SD880-Y
Q907		Transistor, 2SA1020-Y
D001, 004, 107, 108, 109, 110, 111, 401, 402, 404, 601, 602, 603, 604, 608, 609, 616, 617, 629, 631, 633, 634, 635, 637,		Diode, 1S1555

Symbol No.	Part No.	Description
D638, 639, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 729, 730, 731, 732, 734, 735, 737, 738, 741, 742, 743, 744, 905, 912		Diode, 1S1555
D002, 003		Diode, 1SV101
D005		Diode, Zener, 05Z3.9
D101, 102		Diode, 1SV100
D103, 104, 105, 106		Diode, 1S2186
D108, 109, 110, 611, 612, 635, 636, 728	22115602	Diode, 1N60
D112		Diode, Zener, 02Z5.6A
D201, 615		Diode, TLR205, (LED)
D610		Diode, TLG205, (LED)
D605, 606	22115603	Diode, 1N60FD1
D619 to 623, 624 to 628		Diode, (LED) S4448
⚠ D901, 902		Diode, 1B2Z1
⚠ D903, 904		Diode, 1B2C1
D906		Diode, Zener, 02Z12A
D907		Diode, Zener, 02Z8.2A
D909		Diode, Zener, 02Z16A
D910		Diode, Zener, 02Z7.5A
D911		Diode, S5277B-LC8
COILS & TRANSFORMERS		
L001	22294007	Coil, FM, RF, LH8406R
L002	22294361	Coil, FM, RF
L003	22294016	Coil, LH8404R
L004	22294048	Coil, FM, LH8019

Symbol No.	Part No.	Description
L101	22291103	Coil, Choke
L102	22282206	Coil, Antenna, SW2
L103	22282205	Coil, Antenna, SW1
L104, 105	22242819	Coil, Antenna, LW, MW
L107	22285308	Coil, Oscillator, SW2
L108	22285307	Coil, Oscillator, SW1
L109	22245370	Coil, Oscillator, MW
L110	22205067	Coil, Oscillator, LW
L111	22265810	IF, Transformer, FM
L112, 703, 707, 708, 709	22230106	Coil, Choke, 470μH
L113	22267389	IF, Transformer, 16S7389, FM, CUAD
L114	22264822	IF, Transformer, 15S4822, AM
L115	22264823	IF, Transformer, 15S4823, AM
L201	22232193	Coil, Choke
L501	22235190	Coil, Oscillator, Tape
L502	22241028	Coil, Choke, 100μH
L601, 602	22232203	Coil, Choke, 22mH
L603, 604, 704	22232207	Coil, Choke, 2.2mH
L605, 606	22153164	Dolby Filter, ORG
L607, 608	22153165	Dolby Filter, BLK
L702	22235194	Coil, Oscillator, Tape
L705	22215106	Coil, Oscillator
⚠ L901	22223848	Power Transformer, TE, TU
⚠ L901	22223907	Power Transformer, AY
ELECTRICAL PARTS		
A001, 002	22124476	Rod Antenna
Z001	22137760	Filter, FM, RF
Z101, 102	22153124	Filter, Ceramic, 10.7MS
Z103	22153156	Filter, Ceramic, SFP4501
Z104	22153150	Filter, Ceramic, SFA10.7
Z201, 202	22153078	Filter, MPX
W1, 2	22152329	Speaker, SP16S4V
W3, 4	22152308	Speaker, SP04T2C
⚠ F901	22144293	Fuse, 1.6A/250V, Time Lug
G401, 402	22154225	Microphone Unit
J301, 302	22163666	Jack, φ3.5, Ext. Speaker
J303	22163778	Jack, Headphone
J401, 402, 601, 602	22163789	Jack, US-4P
J403, 404	22163818	Jack, φ6.3-2E, Ext. Microphone
J405 (S7)	22167869	Socket, DIN (5P-S)
⚠ J901	22167687	Socket, AC/DC-2P, AY
⚠ J901	22167876	Socket, AC/DC-2P, TE, TU
EP01	22165047	Fuse Holder

Symbol No.	Part No.	Description
EP02	22167688	Back Cover, AC Socket
EP03	22104517	LCD Clock Unit
EP04	22153127	Crystal, 9 MHz
EP05	22162461	Terminal, 2P
S1, 2	22195659	Switch, Push, S1 --- Power S2 --- Timer
S3, 10, 11	22195651	Switch, Push, S3 --- Dolby S10 --- Tape Select S11 --- Auto Manual
S5	22195652	Switch, Push, Band Select
S6	22195421	Switch, Slide, Record/ Playback
S8	22195653	Switch, Lever, Function
S9-1 to 3	22195362	Switch, Lever, Beat/Mode
S12	22195199	Switch, Leaf, Start/Muting
S13	22195555	Switch, Leaf, Power
S14	22195603	Switch, Leaf, Pause
S701 to 716	22195171	Switch, Key Push

CAPACITORS

D = ±0.5pF, J = ±5%, K = ±10%, M = ±20%, Z = −20, +80%

Work voltages of capacitor are DC 50V unless otherwise noted.

Abbreviations: CD = Ceramic Disk, EL = Electrolytic, MY = Mylar, PP = Polypropylene, BL = Barrier Layer

Symbol No.	Part No.	Description
C002	22309159	Trimmer
C003	22362221	CD, 220pF, K
C004	22361309	CD, 3pF, D
C005	22362331	CD, 330pF, K
C006	22361209	CD, 2pF, D
C007	22362331	CD, 330pF, K
C008	22342223	CD, 0.022mfd, Z
C009	22360133	CD, 180pF, CH, J
C010	22362221	CD, 220pF, K
C011	22362150	CD, 15pF, K
C012	22362470	CD, 47pF, K
C013	22362331	CD, 330pF, K
C014	22342223	CD, 0.022mfd, Z
C016	22361509	CD, 5pF, D
C017	22362331	CD, 330pF, K
C018	22362560	CD, 56pF, K
C020	22361509	CD, 5pF, D
C021, 022	22361609	CD, 6pF, D
C023	22361209	CD, 2pF, D
C101	22362820	CD, 82pF, K
C102	22362220	CD, 22pF, K
C103, 105	22309168	Trimmer
C104	22362120	CD, 12pF, K
C107, 109	22309155	Trimmer
C110	22362101	CD, 100pF, K
C111	22360484	CD, 0.047mfd, Z
C112	22342223	CD, 0.047mfd, Z
C113	22342223	CD, 0.047mfd, Z
C114	22342223	CD, 0.047mfd, Z
C115	22342223	CD, 0.047mfd, Z
C116	22342102	CD, 0.01mfd, Z
C117	22342223	CD, 0.022mfd, Z
C120	22321024	PP, 4700pF, K
C123	22321061	PP, 2200pF, J
C126	22321055	PP, 680pF, J
C127	22362331	CD, 330pF, K
C129	22321053	PP, 470pF, J
C130	22342223	CD, 0.022mfd, Z
C131	22342223	CD, 0.022mfd, Z
C132	22342223	CD, 0.022mfd, Z
C133	22342223	CD, 0.022mfd, Z
C134	22483221	EL, 220mfd, 10V
C135	22342223	CD, 0.022mfd, Z
C136	22371473	MY, 0.047mfd, J
C137	22342223	CD, 0.022mfd, Z
C138	22485100	EL, 10mfd, 16V
C139	22362101	CD, 100pF, K
C140	22483470	EL, 47mfd, 10V
C141	22360484	CD, 0.047mfd
C142	22362391	CD, 390pF, K
C145	22342223	CD, 0.022mfd, Z
C146	22483101	EL, 100mfd, 10V
C147	22360329	BL, 0.022mfd, M, 25V
C148	22342223	CD, 0.022mfd, Z
C151	22349102	CD, 0.001mfd, K
C152	22342103	CD, 0.01mfd, Z
C153	22483221	EL, 220mfd, 10V
C154, 155	22342223	CD, 0.022mfd, Z
C156, 157	22342103	CD, 0.01mfd, Z
C158	22349102	CD, 1000pF, K
C160	22371473	MY, 0.047mfd, J
C161	22483101	EL, 100mfd, 10V
C162, 163	22488109	EL, 1mfd
C164	22342223	CD, 0.022mfd, Z
C167, 168	22488108	EL, 0.1mfd
C170	22342103	CD, 0.01mfd, Z
C171	22342223	CD, 0.022mfd, Z
C172	22349472	CD, 4700pF, K
C175	22360484	CD, 0.047mfd, Z
C180, 181	22349392	CD, 3900pF, K
C182	22362101	CD, 100pF, K
C183	22342223	CD, 0.022mfd, Z
C201	22362181	CD, 180pF, K
C202	22488478	EL, 0.47mfd
C203	22362331	CD, 330pF, K
C204	22488478	EL, 0.47mfd
C205	22488228	EL, 0.22mfd
C206	22371102	MY, 1000pF, J

Symbol No.	Part No.	Description
C207	22488479	EL, 4.7mfd
C208	22483101	EL, 100mfd, 10V
C301, 302	22360322	BL, 1500pF, M, 25V
C303, 304	22360331	BL, 0.047mfd, M, 25V
C305, 306	22360330	BL, 0.033mfd, M, 25V
C307, 308	22488338	EL, 0.33mfd, 50V
C309, 310	22360332	BL, 0.068mfd, M, 25V
C311, 312	22360322	BL, 1500pF, M, 25V
C313, 314	22488478	EL, 0.47mfd
C315, 316	22360322	BL, 1500pF, M, 25V
C317	22483221	EL, 220mfd, 10V
C318	22485101	EL, 100mfd, 16V
C319, 320	22349391	CD, 390pF, K
C321, 322	22485330	EL, 33mfd, 16V
C323, 324	22342223	CD, 0.022mfd, Z
C325, 326	22349101	CD, 100pF, K
C327, 328	22483331	EL, 330mfd, 10V
C329, 330	22349103	CD, 0.01mfd, K
C331, 332	22360331	BL, 0.047mfd, M, 25V
C333, 334	22372104	MY, 0.1mfd, K
C335, 336	22483102	EL, 1000mfd, 10V
C337	22360331	BL, 0.047mfd, M, 25V
C401, 402	22488478	EL, 0.47mfd
C405, 406	22360324	BL, 3300pF, M, 25V
C407, 408	22468478	EL, 0.47mfd
C409, 410	22362101	CC, 100pF, K
C411, 412	22349102	CD, 1000pF, K
C413, 414	22485330	EL, 33mfd, 16V
C415, 416	22488229	EL, 0.22mfd
C417, 418	22360325	BL, 4700pF, M, 25V
C419, 420	22373822	MY, 8200pF, M
C421, 422	22373273	MY, 0.027mfd, M
C423	22488339	EL, 3.3mfd
C424	22488339	EL, 3.3mfd, 50V
C425, 426	22349391	CD, 390pF, K
C427, 428	22488228	EL, 0.22mfd
C429, 430	22483101	EL, 100mfd, 10V
C431, 432	22371153	MY, 0.015mfd, J
C433, 434	22488339	EL, 3.3mfd
C435	22483471	EL, 470mfd, 10V
C436	22483470	EL, 47mfd, 10V
C437, 438	22349471	CD, 470pF, K
C439, 440	22362101	CD, 100pF, K
C441	22483470	EL, 47mfd, 10V
C442	22483471	EL, 470mfd, 10V
C445, 446	22349472	CD, 4700pF, K
C448	22488339	EL, 3.3mfd
C501	22371224	MY, 0.22mfd, J
C502	22371154	MY, 0.15mfd, J
C503, 504	22349221	CD, 220pF, K
C506	22371123	MY, 0.012mfd, J
C507	22371153	MY, 0.015mfd, J
C508	22371333	MY, 0.012μF, J

Symbol No.	Part No.	Description
C509, 510	22371103	MY, 0.01mfd, J
C511	22483221	EL, 220mfd, 10V
C512	22483471	EL, 470mfd, 10V
C513	22371333	MY, 0.033mfd, J
C601, 602	22488339	EL, 3.3mfd
C603, 604	22371153	MY, 0.015mfd, J
C605, 606	22371472	MY, 4700pF, J
C607, 608	22488339	EL, 3.3mfd
C609, 610	22485100	EL, 10mfd, 16V
C611, 612	22480003	EL, 0.1mfd
C613, 614	22480003	EL, 0.1mfd
C615	22488339	EL, 3.3mfd
C616	22488339	EL, 3.3mfd
C617, 618	22480006	EL, 0.33mfd
C619	22483471	EL, 470mfd, 10V
C620	22485100	EL, 10mfd, 16V
C621, 622	22371153	MY, 0.015mfd, J
C623	22488339	EL, 3.3mfd
C624	22488339	EL, 3.3mfd
C625, 626	22488478	EL, 0.47mfd
C627, 628	22485100	EL, 10mfd, 16V
C629, 630	22360322	BL, 1500pF, M, 25V
C631, 632	22349151	CD, 150pF, K
C633, 634	22488479	EL, 4.7mfd
C635, 636	22371683	MY, 0.068mfd, J
C637, 638	22488339	EL, 3.3mfd
C639, 640	22488339	EL, 3.3mfd
C641, 642	22488339	EL, 3.3mfd
C643, 644	22480006	EL, 0.33mfd
C645, 646	22488479	EL, 4.7mfd
C647, 648	22488109	EL, 1mfd
C649, 650	22371472	MY, 4700pF, J
C651	22483101	EL, 100mfd, 10V
C653, 654	22488339	EL, 3.3mfd
C657	22483470	EL, 47mfd, 10V
C658	22349102	CD, 1000pF, K, 50V
C701	22349102	CD, 0.001mfd, K
C702	22488478	EL, 0.47mfd
C703	22360332	BL, 0.068mfd, M, 25V
C704	22360137	CD, 39pF, J
C705	22360136	CD, 33pF, J
C706	22342223	CD, 0.022mfd, Z
C707	22483221	EL, 220mfd, 10V
C708	22342223	CD, 0.022mfd, Z
C709	22483221	EL, 220mfd, 10V
C710, 711	22342223	CD, 0.022mfd, Z
C712	22342103	CD, 0.01mfd, Z
C713	22488108	EL, 0.1mfd
C714	22488229	EL, 2.2mfd
C715	22485221	EL, 220mfd, 16V
C716	22342223	CD, 0.022mfd, Z
C717	22483221	EL, 220mfd, 10V
C718	22342223	CD, 0.022mfd, Z

Symbol No.	Part No.	Description
C719	22488339	EL, 3.3mfd
C720	22483471	EL, 470mfd, 10V
C721	22483221	EL, 220mfd, 10V
C722	22349222	CD, 2200pF, K
C723	22342223	CD, 0.022mfd, Z
C724	22349102	CD, 1000pF, K
C725	22349102	CD, 1000pF, K
C726, 727	22488109	EL, 1mfd
C728	22488229	EL, 2.2mfd
C729	22488478	EL, 0.47mfd
C730	22342223	CD, 0.022mfd, Z
C731	22371562	MY, 5600pF, J
C732	22349331	CD, 330pF, K
C733	22342223	CD, 0.022mfd, Z
C735	22488109	EL, 1mfd
C736	22342223	CD, 0.022mfd, Z
C737	22349222	CD, 2200pF, K
C738	22483470	EL, 47mfd, 10V
C739	22360484	CD, 0.047mfd, Z
C740	22483101	EL, 100mfd, 10V
C741, 742	22360484	CD, 0.047mfd, Z
C743	22349102	CD, 1000pF, K
C744, 745	22488109	EL, 1mfd
C746	22485102	EL, 1000mfd, 16V
C747	22362101	CD, 100pF, K
C748	22483221	EL, 220mfd, 10V
C749	22362331	CD, 330pF, K
C750	22349222	CD, 2200pF, K
C751	22485330	EL, 33mfd, 16V
C752	22360484	CD, 0.047mfd, Z
C753	22362101	CD, 100pF, K
C754	22360329	BL, 0.022mfd, M, 25V
C755	22342223	CD, 0.022mfd, Z
C756	22349472	CD, 0.047mfd, K
C758	22362101	CD, 100pF, K
C760	22488228	EL, 0.22mfd
C761	22483470	CD, 47mfd, 10V
C762	22485100	EL, 10mfd, 16V
C763	22485221	EL, 220mfd, 16V
C764	22485220	EL, 22mfd, 16V
C765	22349472	CD, 0.047mfd, K
C766, 767	22349102	CD, 1000pF, K
C768	22349102	CD, 1000pF, K
C769	22362330	CD, 33pF, K
C770	22362151	CD, 150pF, K
⚠ C901, 902	22342223	CD, 0.022mfd, Z
⚠ C903, 904	22342223	CD, 0.022mfd, Z
⚠ C905	22486222	EL, 2200mfd, 25V
C907	22342223	CD, 0.022mfd, Z
C908	22485101	EL, 100mfd, 16V

Symbol No.	Part No.	Description
C909	22360484	CD, 0.047mfd, Z
C910	22485221	EL, 220mfd, 16V
C911	22485331	EL, 330mfd, 16V
C912	22360484	CD, 0.047mfd, Z
C913	22485331	EL, 330mfd, 16V
C915	22483221	EL, 220mfd, 10V
C916, 917	22342223	CD, 0.022mfd
C918	22485331	EL, 330mfd, 16V
C919	22342223	CD, 0.022mfd, Z
C920	22349103	CD, 0.01mfd, K
C921	22342223	CD, 0.022mfd, Z
C922	22485221	EL, 220mfd, 16V
C923, 924	22475479	EL, 4.7mfd, 16V

RESISTORS

1. **Resistors are Carbon film ¼W, ±5%, unless otherwise noted.**
2. **PRC is short for the printed resistor circuit. If replacement of the resistor in PRC is required, please use the substitutional fixed carbon film resistor of ¼W, ±5% according to the following list.**

K = 1000, M = 1000000

Symbol No.	Part No.	Description
R001	22545102	1K ohm
R002	22555104	100K ohm
R003	22545470	47 ohm (PRC)
R004	22545682	6.8K ohm (PRC)
R005	22545102	1K ohm (PRC)
R006	22555683	68K ohm
R007	22555104	100K ohm
R008	22555823	82K ohm
R009	22555681	680 ohm
R010	22555331	330 ohm
R015	22555222	2.2K ohm
R102	22545104	100K ohm (PRC)
R103	22555103	10K ohm
R104	22545104	100K ohm (PRC)
R105	22555562	5.6K ohm
R107	22555224	220K ohm
R109	22545470	47 ohm
R110	22545102	1K ohm (PRC)
R111	22545151	150 ohm (PRC)
R112	22545682	6.8K ohm (PRC)
R114	22545331	330 ohm (PRC)
R115	22545151	150 ohm (PRC)
R116	22545279	2.7 ohm for TA7614AP-Y
R117	22545151	150 ohm (PRC)
R118	22555182	1.8K ohm
R123	22545151	150 ohm (PRC)
R124	22545182	1.8K ohm (PRC)
R125	22545182	1.8K ohm (PRC)
R126	22545332	3.3K ohm (PRC)

Symbol No.	Part No.	Description
R127	22545123	12K ohm (PRC)
R128	22545331	330 ohm
R129	22545102	1K ohm (PRC)
R130	22550177	470 ohm, 1/8W
R131	22555104	100K ohm
R132	22555103	10K ohm
R133	22555474	470K ohm
R135	22555392	3.9K ohm
R136, 137	22555682	6.8K ohm
R138	22555221	220 ohm
R139	22555331	330 ohm
R141	22545152	1.5K ohm (PRC)
R142	22555562	5.6K ohm
R143	22545473	47K ohm (PRC)
⚠ R144, 145	22545470	47 ohm
R146	22545152	1.5K ohm
R147	22545102	1K ohm (PRC)
R148	22545562	5.6K ohm (PRC)
R149	22545101	100 ohm (PRC)
R150	22545563	56K ohm
R151, 152	22550196	22K ohm
R153	22550181	1K ohm, 1/8W
R154	22550185	2.2K ohm, 1/8W
R155	22550194	15K ohm, 1/8W
R188	22555392	3.9K ohm
R201	22545102	1K ohm (PRC)
R202	22545562	5.6K ohm (PRC)
R203, 657	22658498	Semi-fixed Variable, 10K-B, Free Run
R204	22545104	100K ohm (PRC)
R205	22545102	1K ohm (PRC)
R206	22555154	150K ohm for TA7323P-O
R206	22555104	100K ohm for TA7323P-Y
R206	22555823	82K ohm for TA7323P-GR
R209, 210	22545332	3.3K ohm (PRC)
R211, 212	22545682	6.8K ohm (PRC)
R301, 302, 305, 306	22651537	Variable, ø16, 100K-B, Bass/ Treble
R303, 304	22545123	12K ohm (PRC)
R307, 308	22545102	1K ohm (PRC)
R309, 310	22545472	4.7K ohm
R311, 312	22545822	8.2K ohm (PRC)
R313, 314	22651536	Variable, ø16, 50K-B, Volume
R315, 316	22545222	2.2K ohm (PRC)
R317, 318	22545473	47K ohm (PRC)
R319, 320	22545820	82 ohm (PRC)
R321, 322	22545123	12K ohm (PRC)
R323, 324	22545273	27K ohm (PRC)
R325, 326	22555151	150 ohm
R327	22555682	6.8K ohm (PRC)
R328	22545274	270K ohm (PRC)
R329	22625420	Variable, ø16, 50K-B, Balance
R330, 331	22545822	8.2K ohm (PRC)

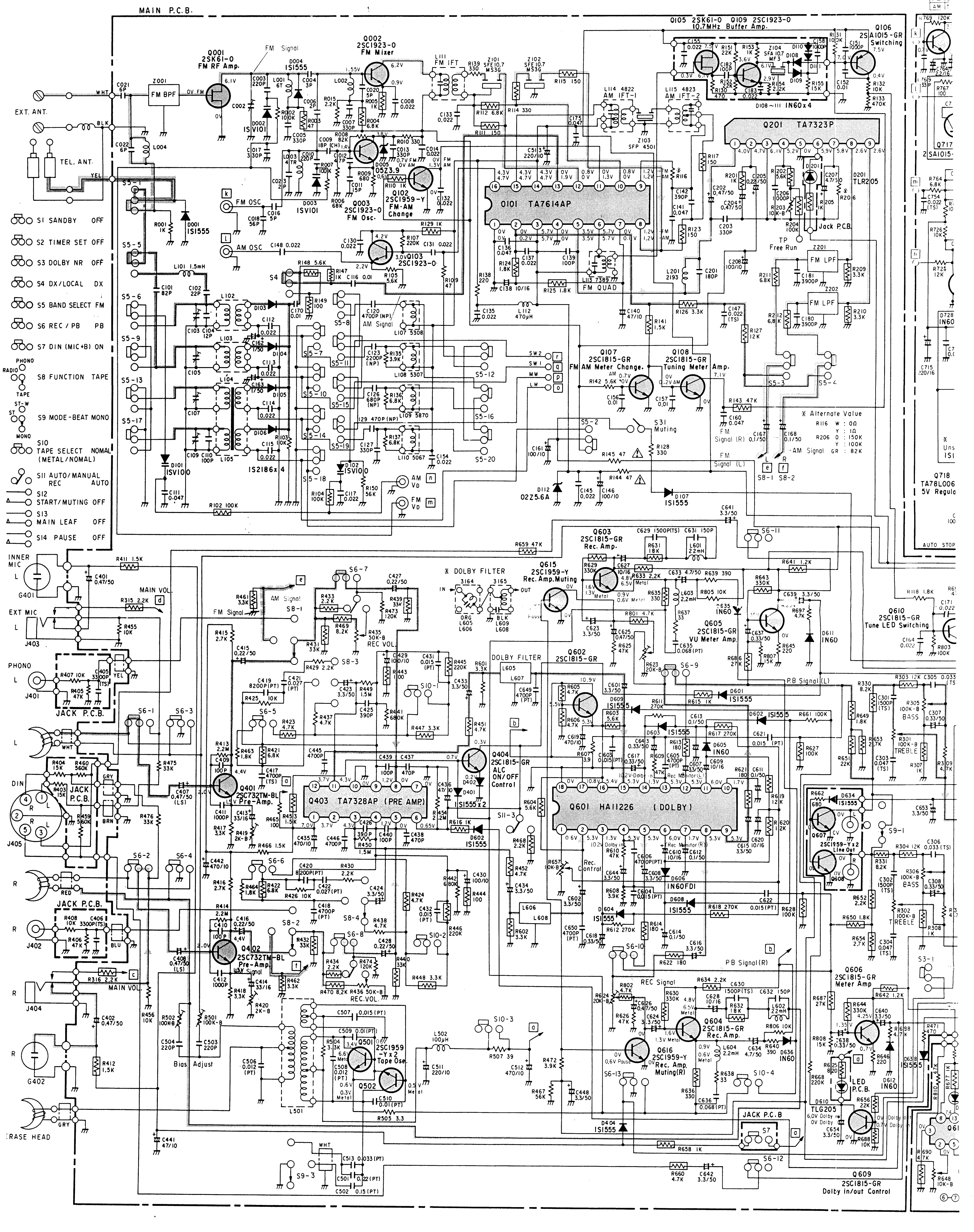
Symbol No.	Part No.	Description
R403, 404	22555153	15K ohm
R405, 406	22555473	47K ohm
R407, 408	22555103	10K ohm
R411, 412	22545152	1.5K ohm (PRC)
R413, 414	22555225	2.2M ohm
R415, 416	22555272	2.7K ohm
R417, 418	22555332	3.3K ohm
R419, 420	22658512	Semi-fixed Variable, 2K-B, Pre-Amp. Control
R421, 422	22545682	6.8K ohm (PRC)
R423, 424	22545472	4.7K ohm (PRC)
R425, 426	22555103	10K ohm
R429, 430	22555222	2.2K ohm
R431, 432	22545333	33K ohm (PRC)
R433, 434	22545222	2.2K ohm (PRC)
R435, 436	22655431	Variable, ø16 50K-B (REC. Volume)
R437, 438	22545472	4.7K ohm
R439, 440	22545333	33K ohm (PRC)
R441, 442	22555684	680K ohm
R443, 444	22545101	100 ohm (PRC)
R445, 446	22545224	220K ohm (PRC)
R447, 448	22545332	3.3K ohm (PRC)
R449, 450	22555155	1.5M ohm
R451, 452	22545472	4.7K ohm (PRC)
R453	22545152	1.5K ohm (PRC)
R454	22555225	2.2M ohm
R455	22545103	10K ohm
R456	22555103	10K ohm
R459, 460	22555564	560K ohm
R461, 462	22545332	3.3K ohm (PRC)
R463, 464	22555182	1.8K ohm
R465	22555101	100 ohm
R466	22555152	1.5K ohm
R467	22555563	56K ohm
R468	22545222	2.2K ohm (PRC)
R469, 470	22545822	8.2K ohm (PRC)
R471	22555471	470 ohm
R472	22555392	3.9K ohm
R473, 474	22555124	120K ohm
R475, 476	22555333	33K ohm
R477	22555563	56K ohm
R478, 479	22555123	12K ohm
R501, 502	22658465	Semi-fixed Variable, 100K-B, Bias Adjust
R504	22545332	3.3K ohm
R505	22545339	3.3 ohm
R507	22555390	39 ohm
R601	22555332	3.3K ohm
R602	22545332	3.3K ohm (PRC)
R603, 604	22545562	5.6K ohm (PRC)
R605, 606	22545472	4.7K ohm (PRC)
R607, 608	22555392	3.9K ohm

Symbol No.	Part No.	Description
R609, 610	22555473	47K ohm
R611, 612	22545274	270K ohm
R613, 614	22545181	180 ohm (PRC)
R615, 616	22545102	1K ohm (PRC)
R617, 618	22545274	270K ohm (PRC)
R619, 620	22545123	12K ohm (PRC)
R621, 622	22545181	180 ohm (PRC)
R623, 624	22658493	Semi-fixed Variable 20K-B
R625, 626	22555472	4.7K ohm
R627, 628	22545104	100K ohm (PRC)
R629, 630	22545334	330K ohm (PRC)
R631, 632	22545183	18K ohm (PRC)
R633, 634	22545222	2.2K ohm (PRC)
R635, 636	22545331	330 ohm (PRC)
R637, 638	22555330	33 ohm
R639, 640	22555391	390 ohm
R641, 642	22545122	1.2K ohm (PRC)
R643, 644	22545334	330K ohm (PRC)
R645, 646	22555221	220 ohm
R647, 648	22658498	Semi-fixed Variable, 10K ohm, VU Meter Input Adjust.
R649, 650	22545182	1.8K ohm (PRC)
R651, 652	22545222	2.2K ohm (PRC)
R653, 654	22545272	2.7K ohm (PRC)
R655	22545821	820 ohm (PRC)
R656	22545223	22K ohm (PRC)
R658	22545102	1K ohm (PRC)
R659, 660	22545472	4.7K ohm (PRC)
R661	22555104	100K ohm
R662	22555681	680 ohm
R664	22545102	1K ohm (PRC)
R665	22555183	18K ohm
R666	22555152	1.5K ohm
R667	22555223	22K ohm
R668	22555224	220K ohm
R670, 671	22545104	100K ohm (PRC)
R672, 673	22545153	15K ohm (PRC)
R674, 675	22545103	10K ohm (PRC)
R676	22545102	1K ohm (PRC)
R677, 678	22545102	1K ohm (PRC)
R679, 680	22545102	1K ohm (PRC)
R681, 682	22545102	1K ohm (PRC)
R683, 684	22545102	1K ohm (PRC)
R685	22545102	1K ohm (PRC)
R686, 687	22545273	27K ohm (PRC)
R688	22545103	10K ohm (PRC)
R689, 690	22545473	47K ohm (PRC)
R691	22555560	56 ohm
R693	22545331	330 ohm (PRC)
R694	22545562	5.6K ohm
R696	22545473	47K ohm (PRC)
R697, 698	22545472	4.7K ohm
R701, 702	22555823	82K ohm

Symbol No.	Part No.	Description
R703, 704	22555823	82K ohm
R705, 706	22545473	47K ohm
R707, 708	22545473	47K ohm
R709	22555104	100K ohm
R710	22555392	3.9K ohm
R711	22555225	2.2M ohm
R712	22545474	470K ohm
R713	22545224	220K ohm
R714	22555124	120K ohm
R716	22545682	6.8K ohm
R717	22545563	56K ohm
R718	22555392	3.9K ohm
R719	22555123	12K ohm
R720	22545220	22 ohm
R721	22555563	56K ohm
R722	22555223	22K ohm
R723	22555333	33K ohm
R724	22545103	10K ohm
R725	22555563	56K ohm
R726	22545103	10K ohm
R727	22555822	8.2K ohm
R728	22555123	12K ohm
R731	22545273	27K ohm
R732	22555222	2.2K ohm
R733	22555273	27K ohm
R734	22555562	5.6K ohm
R735	22545103	10K ohm
R736	22555273	27K ohm
R737	22555822	8.2K ohm
R738	22545222	2.2K ohm
R739	22545101	100 ohm
R742, 743	22545104	100K ohm
R744, 745	22545104	100K ohm
R746, 747	22545104	100K ohm
R748	22555473	47K ohm
R749, 750	22555273	27K ohm
R751, 752	22555273	27K ohm
R753	22555473	47K ohm
R754	22555681	680 ohm
R755	22555822	8.2K ohm
R756	22555682	6.8K ohm
R757	22555681	680 ohm
R758	22555184	180K ohm
R759	22555682	6.8K ohm
R760	22555184	180K ohm
R761	22555392	3.9K ohm
R762	22555472	4.7K ohm
R763	22555272	2.7K ohm
R764	22555682	6.8K ohm
R765	22545563	56K ohm
R767	22555101	100 ohm
R768	22555102	1K ohm
R769	22555124	120K ohm

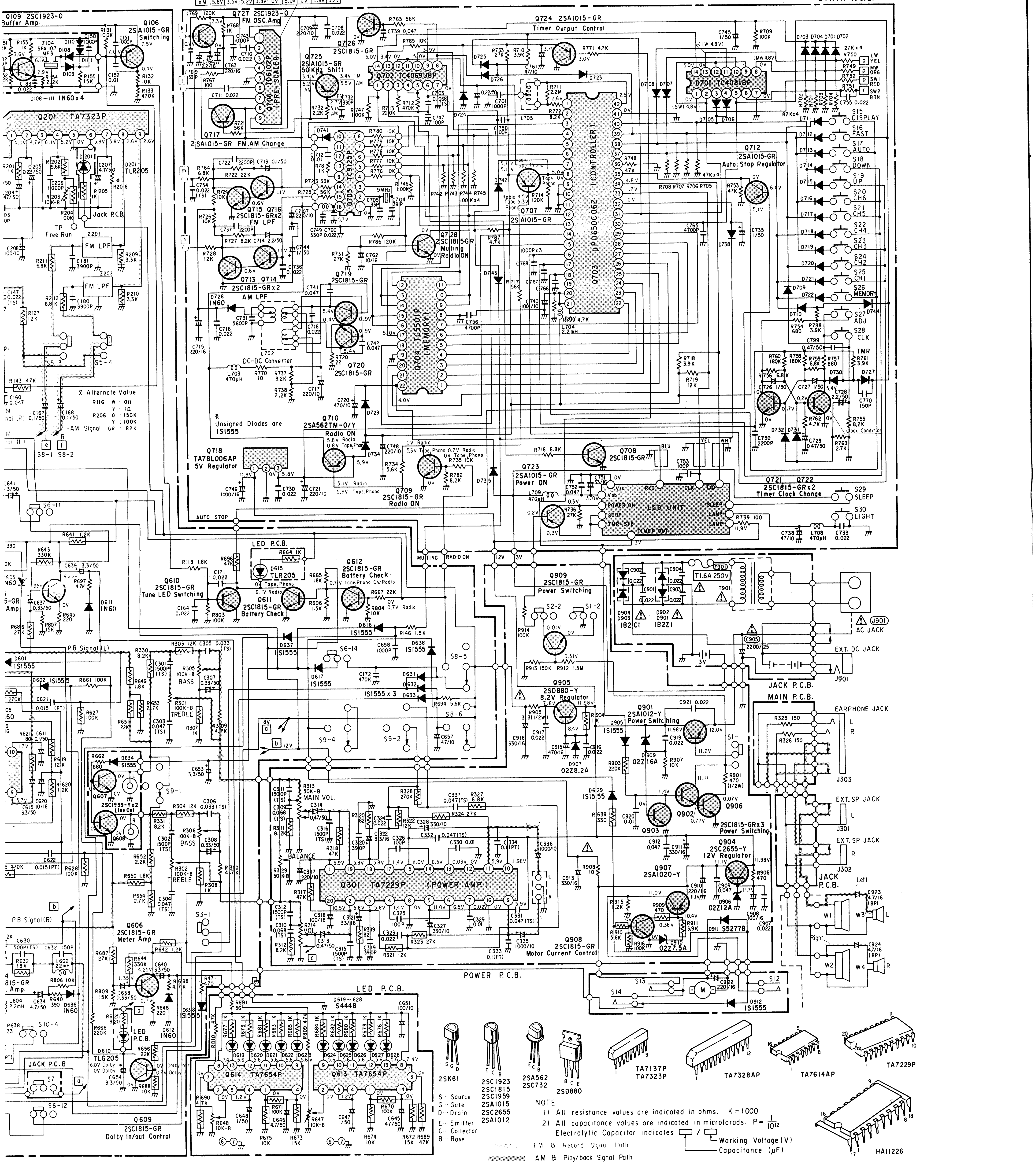
Symbol No.	Part No.	Description
R770	22555100	10 ohm
R771	22555472	4.7K ohm
R772	22545822	8.2K ohm
R776, 777	22540522	10K ohm, 1/8W
R778, 779	22540522	10K ohm, 1/8W
R780	22540522	10K ohm, 1/8W
R781	22555102	1K ohm
R782	22555822	8.2K ohm
R785	22555103	10K ohm
R786	22545124	120K ohm
R787	22555472	4.7K ohm
R788	22555392	3.9K ohm
R801, 802	22545472	4.7K ohm (PRC)
R803	22545104	100K ohm
R804, 805	22545103	10K ohm
R806	22545103	10K ohm
R807	22545153	15K ohm
R808	22555153	15K ohm
R809, 810	22555473	47K ohm
R901	22547471	470 ohm, ½W
R903	22545224	220K ohm (PRC)
R904	22545102	1K ohm (PRC)
⚠ R905	22547339	3.3 ohm, ½W
R906	22555471	470 ohm
R907	22545103	10K ohm
R908	22555100	10 ohm
R909	22545471	470 ohm (PRC)
R910	22545563	56K ohm (PRC)
R911	22545392	3.9K ohm (PRC)
R912	22555155	1.5M ohm
R913	22555154	150K ohm
R914	22545104	100K ohm
R915	22555122	1.2K ohm
R916	22545104	100K ohm (PRC)
ACCESSORIES		
AC01	22902560	Owner's Manual, TE
AC02	22902814	Owner's Manual, TU, AY
⚠ AC03	22176541	Power Supply Cord, TE
⚠ AC04	22176578	Power Supply Cord, TU
⚠ AC06	22176614	Power Supply Cord, AY

SCHEMATIC DIAGRAM


1
2
3
4
5
6
MAIN P.C.B.
EXT. ANT.
TEL. ANT.
FM BPF
Q001 2SK61-0 FM RF Amp.
Q002 2SC1923-0 FM Mixer
Q003 2SC1923-0 FM Osc.
Q102 2SC1959-Y FM·AM Change
Q103 2SC1923-0
FM IFT
FM OSC
AM OSC
Q101 TA7614AP
Q105 2SK61-0 Q109 2SC1923-0 10.7MHz Buffer Amp.
Q106 2SA1015-GR Switching
AM IFT-1
AM IFT-2
Q201 TA7323P
D201 TLR205
Jack P.C.B.
TP Free Run
FM LPF
FM QUAD
Q107 2SC1815-GR FM AM Meter Change.
Q108 2SC1815-GR Tuning Meter Amp.
S31 Muting
IS2186x4
AM VD
FM VD
X Alternate Value
R116 W : 0Ω
Y : 1Ω
R206 Z : 100K
Y : 100K
GR : 82K
FM Signal (R)
AM Signal
FM Signal (L)
S1 SANDBY OFF
S2 TIMER SET OFF
S3 DOLBY NR OFF
S4 DX/LOCAL DX
S5 BAND SELECT FM
S6 REC / PB PB
S7 DIN (MIC+B) ON
S8 FUNCTION TAPE
S9 MODE-BEAT MONO
S10 TAPE SELECT NOMAL (METAL/NOMAL)
S11 AUTO/MANUAL REC AUTO
S12 START/MUTING OFF
S13 MAIN LEAF OFF
S14 PAUSE OFF
Q718 TA78L006 5V Regula
INNER MIC
EXT MIC
PHONO
JACK P.C.B.
DIN
MAIN VOL.
ERASE HEAD
Q401 2SC732TM-BL Pre-Amp.
Q402 2SC732TM-BL Pre-Amp.
Q403 TA7328AP (PRE AMP)
REC VOL.
Q404 2SC1815-GR ALC ON/OFF Control
X DOLBY FILTER
DOLBY FILTER
Q601 HA11226 (DOLBY)
Q602 2SC1815-GR
Q603 2SC1815-GR Rec. Amp.
Q604 2SC1815-GR Rec. Amp.
Q605 2SC1815-GR VU Meter Amp.
Q615 2SC1959-Y Rec. Amp. Muting
Q616 2SC1959-Y Rec. Amp. Muting(R)
Q501 Q502 2SC1959-Yx2 Tape Osc.
Bias Adjust
REC Signal
PB Signal (L)
PB Signal (R)
Q606 2SC1815-GR Meter Amp
Q607 Q608 2SC1959-Yx2 Line Out
Q609 2SC1815-GR Dolby In/out Control
Q610 2SC1815-GR Tune LED Switching
LED P.C.B.
TLG205
BASS
TREBLE
AUTO STOP
1
2
3
4
5
6

SCHEMATIC DIAGRAM

Q706	1	2	3	4	5	6	7	8	9
FM	5.6V	3.4V	5.0V	4.4V	0V	4.9V	5.6V	5.6V	3.4V
AM	5.8V	3.5V	5.2V	3.8V	0V	5.0V	0V	5.8V	5.2V


SYNTH P.C.B.
Q109 2SC1923-O Buffer Amp.
Q106 2SA1015-GR Switching
Q201 TA7323P
Q727 2SC1923-O FM OSC. Amp
Q706 TD6102P (PRE-SCALER)
Q717 2SA1015-GR FM.AM Change
Q725 2SA1015-GR 50KHz Shift
Q726 2SC1815-GR
Q702 TC4069UBP
Q705 TC9125P
Q715 Q716 2SC1815-GR x2 FM LPF
Q713 Q714 2SC1815-GR x2
Q719 2SC1815-GR
AM LPF
DC-DC Converter
Q720 2SC1815-GR
Q728 2SC1815-GR Muting Radio ON
Q724 2SA1015-GR Timer Output Control
Q707 2SA1015-GR
Q704 TC5501P (MEMORY)
Q703 μPD650C062 (CONTROLLER)
Q701 TC4081BP
Q712 2SA1015-GR Auto Stop Regulator
S15 DISPLAY
S16 FAST
S17 AUTO
S18 DOWN
S19 UP
S20 CH6
S21 CH5
S22 CH4
S23 CH3
S24 CH2
S25 CH1
S26 MEMORY
S27 ADJ
S28 CLK
TMR
Q710 2SA562TM-O/Y Radio ON
Q718 TA78L006AP 5V Regulator
Q709 2SC1815-GR Radio ON
Q708 2SC1815-GR
Q723 2SA1015-GR Power ON
LCD UNIT
Q721 Q722 2SC1815-GR x2 Timer Clock Change
S29 SLEEP
S30 LIGHT
X Alternate Value
Unsigned Diodes are 1S1555
AUTO STOP
MUTING
RADIO ON
LED P.C.B.
Q610 2SC1815-GR Tune LED Switching
Q611 2SC1815-GR Battery Check
Q612 2SC1815-GR Battery Check
Q909 2SC1815-GR Power Switching
T1.6A 250V
J901 AC JACK
EXT. DC JACK
JACK P.C.B.
MAIN P.C.B.
EARPHONE JACK
J303
EXT. SP JACK
J301
J302
Q905 2SD880-Y 8.2V Regulator
Q901 2SA1012-Y Power Switching
Q902 Q903 Q906 2SC1815-GR x3 Power Switching
Q904 2SC2655-Y 12V Regulator
Q907 2SA1020-Y
Q908 2SC1815-GR Motor Current Control
Q301 TA7229P (POWER AMP.)
MAIN VOL.
BASS
TREBLE
BALANCE
P.B Signal (L)
P.B Signal (R)
Q607 Q608 2SC1959-Y x2 Line Out
Q606 2SC1815-GR Meter Amp
Q609 2SC1815-GR Dolby In/out Control
LED P.C.B.
Q614 TA7654P
Q613 TA7654P
POWER P.C.B.
JACK P.C.B.
W1 W2 W3 W4
2SK61
2SC1923 2SC1815 2SC1959 2SA1015 2SC2655 2SA1012
2SA562 2SC732
2SD880
TA7137P TA7323P
TA7328AP
TA7614AP
TA7229P
HA11226

S··· Source
G··· Gate
D··· Drain
E··· Emitter
C··· Collector
B··· Base

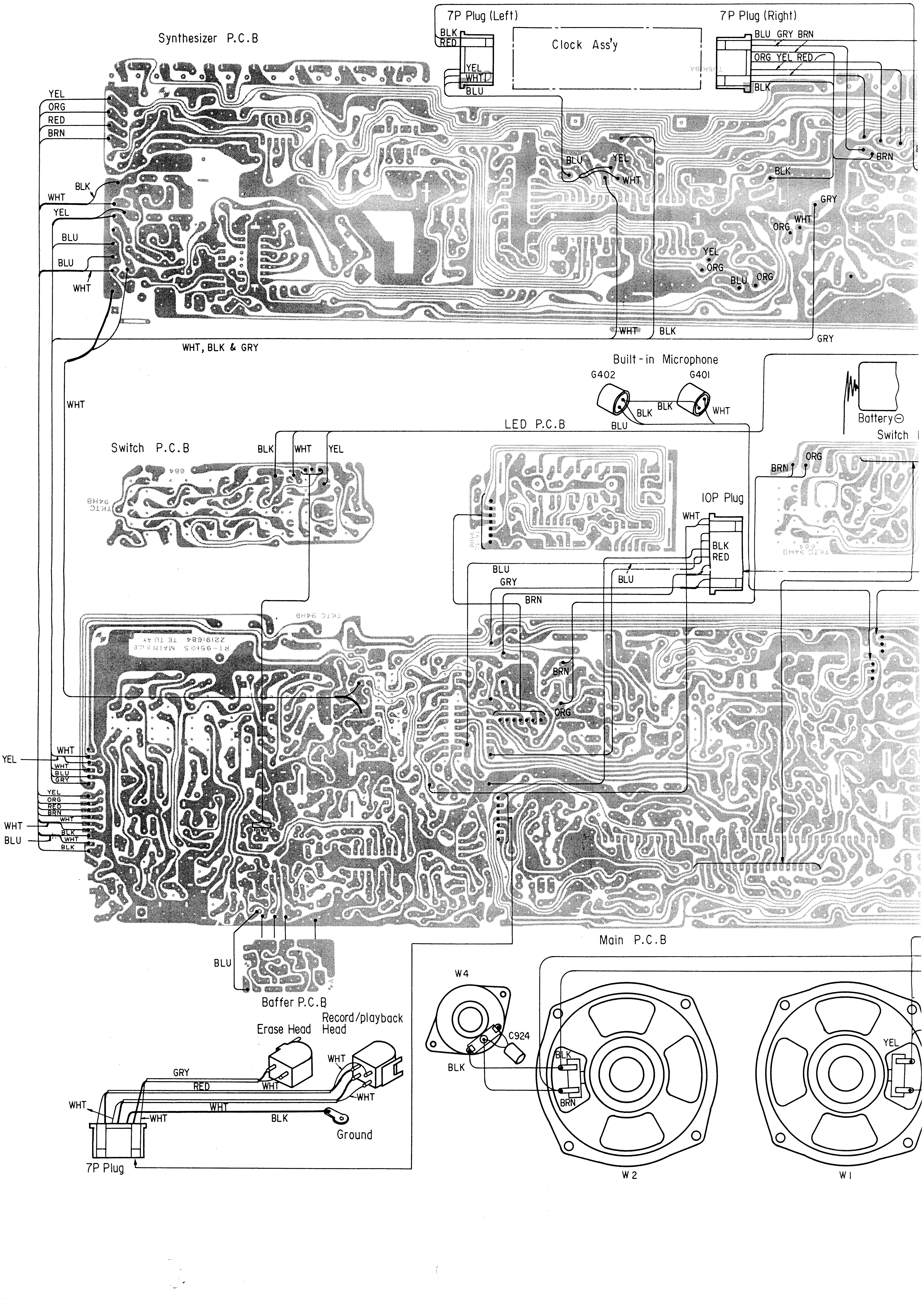
NOTE:

1) All resistance values are indicated in ohms. K = 1000
2) All capacitance values are indicated in microfarads. $P = \frac{1}{10^{12}}$
Electrolytic Capacitor indicates ☐ / ☐ ─ Working Voltage (V) ─ Capacitance (μF)

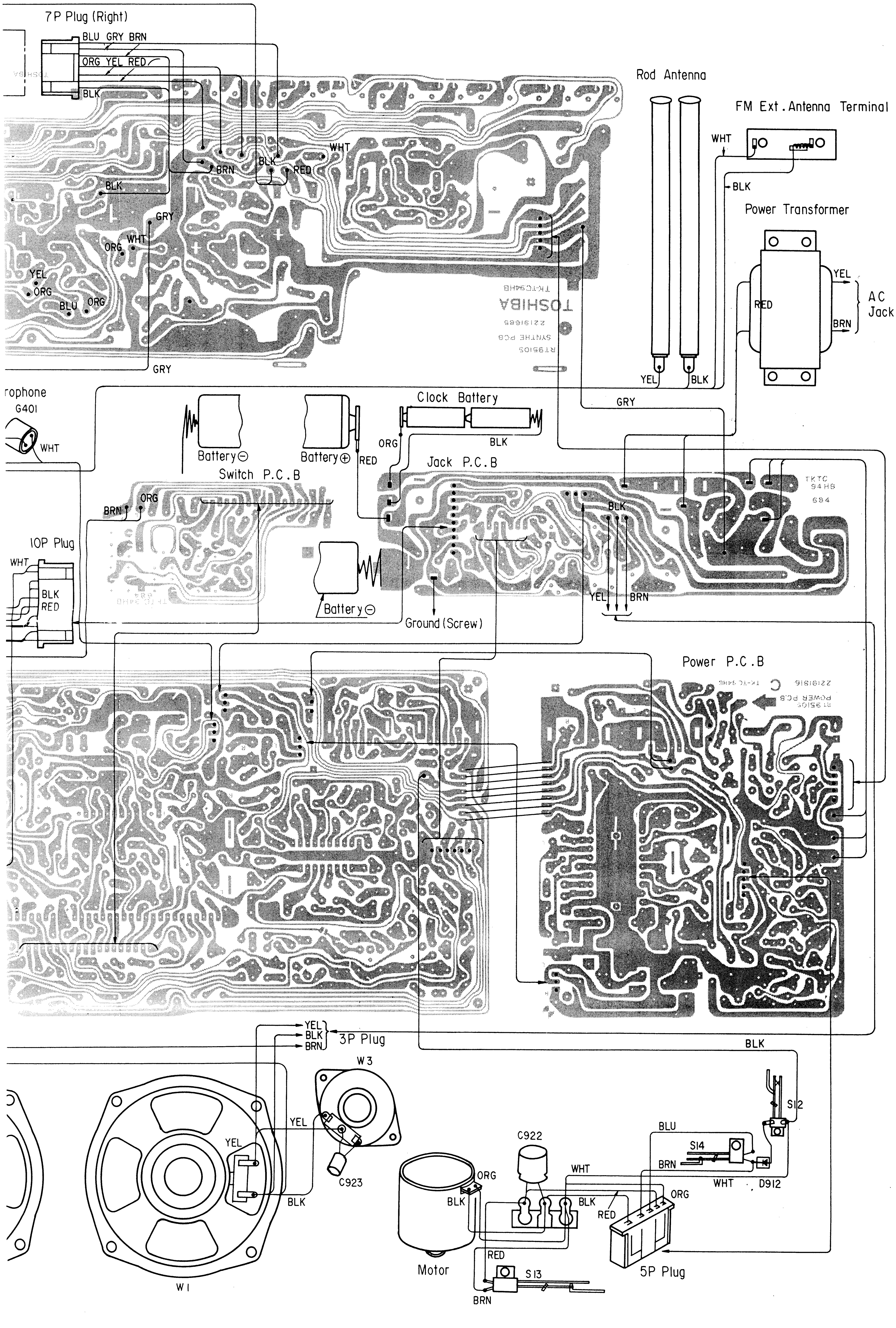
FM & Record Signal Path

▨ AM & Play/back Signal Path

WIRING


7P Plug (Left)
Clock Ass'y
7P Plug (Right)
BLK
RED
YEL
WHT
BLU
BLU GRY BRN
ORG YEL RED
BLK
Synthesizer P.C.B
YEL
ORG
RED
BRN
BLK
WHT
YEL
BLU
BLU
WHT
BLU
YEL
WHT
BRN
BLK
GRY
WHT
ORG
YEL
ORG
BLU
ORG
WHT
BLK
GRY
WHT, BLK & GRY
WHT
Built-in Microphone
G402
G401
BLK
BLK
WHT
BLU
Battery⊖
Switch
LED P.C.B
Switch P.C.B
BLK
WHT
YEL
BRN
ORG
IOP Plug
WHT
BLK
RED
BLU
GRY
BLU
BRN
BRN
ORG
YEL
WHT
WHT
BLU
GRY
YEL
ORG
RED
BRN
WHT
WHT
BLK
WHT
BLU
BLK
BLU
Baffer P.C.B
Main P.C.B
W4
C924
BLK
Erase Head
Record/playback Head
GRY
RED
WHT
WHT
WHT
WHT
WHT
WHT
BLK
Ground
7P Plug
BLK
BRN
YEL
W2
W1

WIRING



7P Plug (Right)
BLU GRY BRN
ORG YEL RED
BLK
BRN
BLK
RED
WHT
BLK
GRY
WHT
ORG
YEL
ORG
BLU
ORG
TOSHIBA
TK-TC94HB
22191685
SYNTHE PCB
RT9510S
GRY
Rod Antenna
FM Ext. Antenna Terminal
WHT
BLK
Power Transformer
YEL
RED
BRN
AC Jack
YEL
BLK
GRY
rophone
G401
WHT
Battery⊖
Battery⊕
RED
Clock Battery
ORG
BLK
Switch P.C.B
Jack P.C.B
TKTC 94HB
694
BRN
ORG
10P Plug
WHT
BLK
RED
BLK
YEL
BRN
Battery⊖
Ground (Screw)
Power P.C.B
22191816
TK-TC94HB
RT9510S
POWER PCB
YEL
BLK
BRN
3P Plug
BLK
W3
YEL
YEL
C923
BLK
W1
C922
ORG
BLK
WHT
BLK
RED
Motor
RED
S13
BRN
BLU
S14
BRN
WHT
D912
S12
ORG
5P Plug